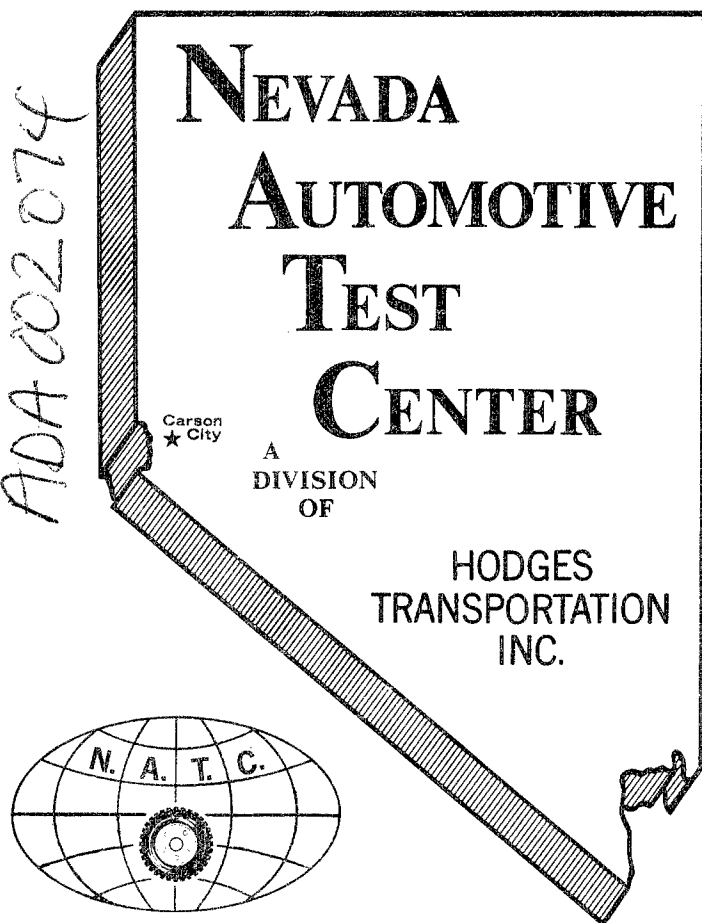


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TECHNICAL REPORT NO. 11908

FINAL REPORT

TREAD DESIGN STUDY OF 9.00R20
RADIAL PLY TIRES

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Contract DAAE07-73-C-0242

NATC Project 20-17-30

July 1974

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TREAD DESIGN STUDY OF 9.00R20
RADIAL PLY TIRES



by James E. Dobbins

HODGES TRANSPORTATION INC.

Date: July 1974

Contract DAAE07-73-C-0242

TACOM

MOBILITY SYSTEMS LABORATORY

U.S. ARMY TANK AUTOMOTIVE COMMAND Warren, Michigan

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Final Report
NATC Project 20-17-30
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110 through 113	"S" Turns - Wet Asphalt

INTRODUCTION

Radial ply tire construction has gained considerable recognition over the past five years and has been proven acceptable in a wide field of wheeled vehicle use. The United States Army has used essentially the same tire tread design since before World War II and found the lug type NDCC tire satisfactory for some applications and marginal or unsatisfactory for others. This test program is one of a series of engineering studies being made to determine the characteristics, attributes and shortcomings of currently available commercial radial ply tires in various environments and applications.

From this and other studies, a composite tread design may be developed to more adequately fulfill military tire requirements, improve vehicular mobility and handling in certain problem areas without compromising existing satisfactory operations, and increase useful tire life. There is another radial ply tire advantage which has been demonstrated in previous military wheeled vehicle comparative tire tests: A modest but consistent reduction in fuel consumption.

The test operation was performed at the Nevada Automotive Test Center proving ground in Lyon County, Nevada, the Sand Mountain Test Site in Churchill County, Nevada, and the Winter Test Facility at West Yellowstone, Montana. This test operation was photographed by John Nellenbach of the U. S. Army Tank Automotive Command under the technical direction of Roger Kirk, also of the U. S. Army Automotive Tank Command. Mr. Kirk also provided technical direction to the Nevada Automotive Test Center division of Hodges Transportation, Inc.

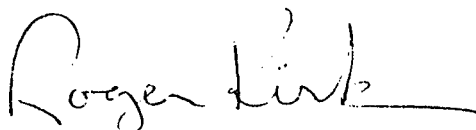
FOREWORD

The current non-directional cross-country (NDCC) tread pattern of bias multi-ply tires have been used, with minor improvements, on U.S. Military tactical wheeled vehicles since World War II. It has been a good aggressive tread design, adapted particularly for military truck purposes where off-the-road mobility is an absolute must. The chief drawback to the NDCC and NDMS designs is that they are not good performers over the road. The low percentage (about 55%) of tread rubber in contact with the road surface means poor ground contact (low net to gross footprint), resulting in very poor wet surface traction and braking, and poor lateral stability on turns.

With the advent of steel belted radial ply truck tires, a great advance in tread life, puncture resistance, ground contact area and vehicle handling and stability are possible. Safety is thus enhanced. In addition, radials have fewer plies than bias tires (in the case of large tires, i.e., 10.00-20 and above, far fewer) and thus run much cooler. This means that delaminations and ply separations are much less likely to occur, reducing the incidence of blow-outs. Because

of the steel belt, the full tread, or at least that part equal to the width of the belt, is in contact with the road and tire squirming at the contact patch is practically eliminated. This means lowering the rolling resistance of the vehicle which results in greater drawbar pull for the same expenditure of energy. In other words, a conservation of fuel.

With all these established advantages in radial ply tires, the Army Tank-Automotive Command sought to establish an all-purpose tread design optimized for highway performance which would at least equal, and hopefully surpass, the off-the-road aggressiveness of the NDCC bias tires. A number of commercial radials with variable degrees of aggressive tread designs were procured, and two brands, one domestic and one foreign, were buffed and retreaded with a TACOM approved tread design. These tires, in the 9.00R20 size, were then tested over a comprehensive variety of surface conditions on a M34, 2-1/2 ton truck at the Nevada Automotive Test Center. The results of the tests are disclosed in this report.



ROGER KIRK
Radial Ply Tire Project Engineer
U.S. Army Tank-Automotive Command

1.0

TEST OBJECTIVE

The objective of this test program was to conduct an engineering evaluation of eight groups of 9.00R20 radial ply tires, with a variety of tread designs, in order to develop data useful in the design of a military radial ply tire. A contract modification added two different bias ply tires for comparison in several static situations. Tread designs included the standard military NDCC, an experimental USATACOM tread, and several commercial designs for on/off-the-road applications.

2.0

SCOPE OF WORK

The following dynamic response characteristics of the M34 2-1/2 ton 6x6 truck (using single 9.00R20 tires instead of duals on the rear axles) were determined as a function of radial ply tire tread design and inflation pressures on eight groups of radial ply tires:

- a. Lateral stability.
- b. Sand, mud, packed clay, virgin and packed snow, dry ice and wet asphalt tractive force.
- c. Wet asphalt and dry ice braking efficiency.
- d. Sand, mud, packed clay, virgin and packed snow, dry ice and dry asphalt rolling resistance.
- e. Ton mile per hour breaker temperature.
- f. Stone retention and rock cut resistance.

Static analysis of the eight radial ply tire groups plus two bias ply 9.00-20 groups was made in each of the following areas:

- a. Spring rates.
- b. Footprint analysis.
- c. X-rays.

In the prepared sand and prepared mud phases of testing early in the program, the Group A tires were incorrectly mounted. This group has a directionally designed tread pattern and was installed with the tread rotating in the reverse direction. To correct this situation, reruns were made in sand and mud and the results integrated into the Test Result Summary and into each of the related test result sections.

3.0 SUMMARY OF TEST RESULTS

Several methods of tire and tread analyses have been employed to provide discrimination between tire groups.

The most fundamental method is to arbitrarily assign values of 1 through 8 based on tire ranking during the tests as shown in Test Results, page 6. This results in the following ranking:

<u>Rank</u>	<u>Group</u>	<u>Total</u>
1	B	78
2	D	81
	J	81
3	G	83
4	C	94
5	E	98
6	A	106
7	F	114

See Groups Rating Summary on the following page.

Another method of analysis is based on the following tests:

1. "S" turns
2. Sand traction
3. Mud traction
4. Dry Ice traction
5. Virgin Snow traction
6. Packed Snow traction
7. Wet Asphalt braking
8. Dry Ice braking
9. Rolling resistance sand
10. Rolling resistance asphalt

These were selected as being characteristics of mobility, control and handling of major importance to military 2-1/2 ton trucks.

3.0 SUMMARY OF TEST RESULTS (Contd.)

Using the same rating system shown on page 6 but limited to the ten tests listed on page 3 the rating of the eight tire groups is as shown below.

Group & Rank	Rating								Total
	1	2	3	4	5	6	7	8	
D	2	1	2	1	1	2		1	39
E	2	1	2		1	2	2		40
A	1	1	1	3	2	1		1	41
G	1	1	3		2	1	1	1	43
C	1	1	2	1	1	2	1	1	44
B	2	1	1		2	1	3		44
F		3		2	1	1		3	49
J	2		2		1	1	1	3	50

An examination of this rating table shows the D group tire to be superior to the other seven groups. Using the ranking from the table on page 3 the D tire is seen to be just below tire Group B. But tire B ranks significantly lower in the ten listed mobility, control and handling characteristics. An examination of the Group Rating Summary on page 6 shows that Group B is low in sand traction which is an important mobility parameter but high in rolling resistance on packed clay which is not considered as significant and leads to the weighting effect of the table above.

A review of the actual test data shows that all of the tires tested tend to be closely grouped.

The higher ply rating of these eight groups of radial tires, 12 and 14 ply rated, as compared to the 8 ply rated 9.00-20 Non Directional Cross-country bias ply Military Standard tires, (tested in Contract DAAE07-70-C-3338, HTI Project 20-14-32-02), makes direct mobility comparisons of the influence of tread design inappropriate because of the different spring rates and tire deflection characteristics.

3.0

SUMMARY OF TEST RESULTS (Contd.)

It is also noticeable in the tests, on virgin snow and hard pack snow which are directly comparable, that the radial tires are notably superior to the bias tires of Project 20-14-32-02 (DAAE07-70-C-3338) and comparable to the only radial tire (Group A) in the test. The sand data also reflects a superiority for radial tires which was slightly reduced because of wind blown sand that mixed into the test course during the late period of the year when these tests were performed.

Of the three tire groups noted above, A, D and G showed better mobility characteristics than the other groups, none were seriously damaged by rock cutting, and D and G did not show stone retention.

3.0 SUMMARY OF TEST RESULTS (Contd.)

Group Rating Summary

<u>Test Phase</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
"J" Turn	G	C	D	J	B	F	A	E
"S" Turn	D	G	E & J		B	C	A	F
Sand Traction	G	D	J	A	E & F		B & C	
Mud Traction	J	F	G	A	B	D	E	C
Dry Ice Traction	B	C	A	F	D	E	J	G
Virgin Snow Traction	B	F	E	A	C	D	G	J
Packed Snow Traction	A	B	C & D		J	G	E	F
Wet Asphalt Traction	J	C	D	B & G		F	E	A
Packed Clay Traction	B	J	G	F	E	A	C	D
Wet Asphalt Braking		C & J	B	F	G	A & E		D
Dry Ice Braking	E	F	G	D	A, B & C			J
Ton Mile Per Hour	C	D	B	A	E	G & J		F
Stone Retention		B, C,	D, G,		J	F	A	E
Cut Resistance	G	A	J	B	D	E	C	F
Rolling Resistance Sand	D	E	G	C	A	J	B	F
Rolling Resistance Mud	J	F	C	E	D	B	G	A
Rolling Resistance Virgin Snow	J	D	B	G	E	F	A	C
Rolling Resistance Packed Snow	J	G	B	E	F	D	A	C
Rolling Resistance Packed Clay	E	B	J	A	G	D	F	C
Rolling Resistance Dry Ice	D	C	B	E	A	G	F	J
Rolling Resistance Dry Asphalt	E	A	D	C	G	F	B	J

This summary places each group in relation to other groups based on the ratings for each test phase. "1" is the highest rating, "8" the lowest and where groups are equal they are joined by a comma or an "&" sign.

4.0 CONCLUSION

The TACOM developed re-capped tread design, Group G exhibits above average performance, whereas the same tread design applied to a different tire carcass, Group J, does not perform as well. This confirms that properly applied radial tire technology requires the tread and carcass to be an integral system with interdependent dynamic characteristics. The x-ray study of these two apparently similar tires shows a significant difference in the geometric lay-up of the belt system, (see Appendix II, this report). Tire Group B, a tread design similar to the TACOM design performs better than "J" and not as well as "G".

Group D, which features the same carcass construction as Group G, but a significantly different tread design, exhibits above average performance and is the best of the U. S. original equipment tires tested in this program.

None of the tire groups tested maximize the traction potential of the standard 2 1/2 ton, 6x6 Military truck.

5.0 RECOMMENDATIONS

Design and/or procure a radial ply tire in the 9.00-20 size, having a ply rating equivalent to standard military 9.00-20 NDCC bias ply tires incorporating either the TACOM tread design or one that has tread and shoulder characteristics found most advantageous in this test program.

Conduct a broad series of studies on dynamic capabilities and static properties of this new design relative to the standard military NDCC bias ply tire. These studies to include:

- Treadwear and durability characteristics.
- Tractive ability in various environments.
- Handling response.
- Lateral stability.
- Footprint and spring rate analyses.

6.0

TEST RESULTS"J" and "S" Turn Measurements

Chart No 1

"J" Turn

<u>Tire Group</u>	<u>Maximum Speed, mph</u>	<u>Differential between front and rear tracks</u>	<u>Control relative to prescribed 90' radius. Rear Wheels</u>
A	29	20.5"	44.0***
B	29	15.0	25.0
C*	30	15.0	40.0**
D	29	11.5	35.5
E	28	12.5	36.0**
F	29	18.5	16.0
G	30	9.0	20.0
J	29	13.5	55.5**
C*	30	11.0	62.0**

Chart No 2

"S" Turn

<u>Tire Group</u>	<u>Maximum Speed, mph</u>	<u>1st Curve</u>	<u>2nd Curve</u>
		<u>Differential between front and rear tracks</u>	<u>Differential between front and rear tracks</u>
A	27	13.0"	29.0"
B	27	9.5	34.5
C*	27	12.0	14.0***
D	28	13.0	31.0
E	28	15.0	29.0
F	27	15.0	27.0
G	28	14.0	24.0
J	28	15.0	27.5
C*	27	12.0	17.0***

* Control Group
 ** Loss of control
 *** Severe understeer

Vehicle: M34 6x6
 GVW: 11,536 pounds
 Mode: 4 Wheel drive

6.0 TEST RESULTS (Contd.)

Chart No. 3

Dynamic Traction - Dry Sand

<u>Group</u>	<u>Drawbar Pounds</u>	
	<u>Inflation Pressure, psig</u>	
	<u>10</u>	<u>15</u>
D*	1850	1350
A	1850	1150
B	1775	1100
C	1800	1050
E	1750	1200
F	1800	1100
G	2100	1350
J	1950	1150
D	1950	1175

Chart No. 4 shows the ratings in percent of drawbar pounds compared to the Control Group D. This was the only test phase that Group D was used as control. All other test phases use Group C as control. The control was run first and last in this test to determine if course conditions were changing during the test. In the case of dry sand testing, a gradient was established at both inflation pressures and this gradient is reflected in the ratings. (Figures No. 1 through 14).

* Control group

6.0 TEST RESULTS (Contd.)

Chart No. 4

Dynamic Traction - Dry Sand

Ratings

<u>Group</u>	<u>Inflation Pressures, psig</u>	
	<u>10</u>	<u>15</u>
D*	100	100
A	97	91
B	93	87
C	95	83
E	92	95
F	95	87
G	111	107
J	103	91

Track depth and width, cone and plate penetrometer measurements and other data taken on each traction run are included with each traction curve figure. Figures No. 15 through 22 graphically plot the daily course cone and plate penetrometer readings across and down the length of the test course.

Vehicle: M34
GVW: 11,536 pounds
Mode: 6 Wheel drive

* Control Group

6.0 TEST RESULTS (Contd.)

Chart No. 5

Rolling Resistance - Dry Sand

Pounds Per Ton

Inflation Pressure, psig

<u>Group</u>	<u>10</u>	<u>15</u>
D*	141	171
A	174	190
B	177	220
C	171	183
E	168	180
F	201	234
G	164	190
J	185	203
D	147	178

* Control group

6.0 TEST RESULTS (Contd.)

Chart No. 6

Rolling Resistance - Dry Sand

Ratings

Group	<u>Inflation Pressures, psig</u>	
	<u>10</u>	<u>15</u>
D*	100	100
A	83	92
B	81	80
C	84	96
E	86	97
F	72	75
G	88	92
J	78	86

Chart No. 6 shows the ratings in percent of pounds per ton rolling resistance in dry sand as compared to the control Group D established gradient. (Figures No. 23 and 24).

Vehicle: M34
GVW: 11,536

* Control group

6.0 TEST RESULTS (Contd.)

Chart No. 7

Dynamic Traction - Prepared Mud

<u>Group</u>	<u>Drawbar Pounds</u>		
	<u>Inflation Pressures, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	1575	1875	2025
A (1)	2475	2200	2150
A (2)	1500	2200	2700
B	2050	2000	2050
D	1900	1825	1900
E	1800	1700	2000
F	2300	2325	2625
G	2000	2075	2675
J	2025	2350	2350

- (1) "A" Group with directional tread mounted incorrectly.
- (2) "A" Group with directional tread mounted correctly and drawbar pounds interpolated.

Chart No. 8 shows the ratings in percent of drawbar pound compared to the control Group C. The control group was run first and last in this test but no course change was recorded (Figures 25 through 34).

6.0 TEST RESULTS (Contd.)

Chart No. 8

Dynamic Traction - Prepared Mud

Ratings

Inflation Pressures, psig

<u>Group</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100
A (1)	157	117	106
A (2)	95	117	133
B	130	107	101
D	121	99	96
E	114	91	99
F	146	124	130
G	127	106	132
J	129	125	116

- (1) "A" Group with directional tread mounted incorrectly.
- (2) "A" Group with directional tread mounted correctly and drawbar pounds interpolated.

6.0 TEST RESULTS (Contd.)

Chart No. 9

Rolling Resistance - Prepared Mud

<u>Group</u>	Pounds Per Ton		
	<u>Inflation Pressures, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	277	319	357
A	308	353	360
B	313	328	331
D	322	326	342
E	266	316	247
F	299	315	335
G	325	334	342
J	285	295	303

Chart No. 10 shows the ratings in percent of pounds per ton rolling resistance in prepared mud as compared to the control group (Figure No. 35).

6.0 TEST RESULTS (Contd.)

Chart No. 10

Rolling Resistance - Prepared Mud

Ratings

Inflation Pressures, psig

<u>Group</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100
A	89	89	100
B	87	97	107
D	84	98	104
E	104	100	103
F	92	101	106
G	83	95	104
J	97	108	115

Vehicle: M34 6x6
GVW: 11,536 pounds.

6.0 TEST RESULTS (Contd.)

Chart No. 11

Dynamic Traction - Dry Ice

Drawbar Pounds

Inflation Pressures, psig

<u>Group</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	950	1250	1000
A	1000	900	1050
B	1000	1050	1200
D	750	850	1150
E	850	925	900
F	800	1050	1000
G	650	750	850
J	600	750	1050
C	900	1250	1000

Chart No. 12 shows the ratings in percent of drawbar pounds compared to the control Group C. The control was run first and last in this test to determine if course conditions were changing during the test. In the case of the dry ice testing, a gradient was established for the 50 psig inflation pressure runs. (Figures No. 36 through 45).

Vehicle: M34 6x6
 GVW: 11,536 pounds
 Mode: 2 Wheel drive (prop shaft to #3 axle removed)

6.0 TEST RESULTS (Contd.)

Chart No. 12

Dynamic Traction - Dry Ice

Ratings

Inflation Pressures, psig

<u>Group</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100
A	107	72	105
B	109	84	120
D	81	68	115
E	90	74	90
F	87	84	100
G	72	60	85
J	66	60	105

Vehicle: M34 6x6

GVW: 11,536 pounds

Mode: 2 Wheel drive (prop shaft to #3 axle removed)

6.0 TEST RESULTS (Contd.)

Chart No. 13

Rolling Resistance - Dry Ice

Drawbar Pounds Per Ton

<u>Group</u>	<u>Inflation Pressure, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	35	41	62
A	38	44	64
B	36	42	64
D	34	38	58
E	38	43	64
F	44	49	72
G	41	46	65
J	50	53	85

Chart No. 14 shows the ratings in percent of pounds per ton rolling resistance on dry ice as compared to the control group C.
(Figure No. 46)

Chart No. 14

Rolling Resistance - Dry Ice
Rating

<u>Group</u>	<u>Inflation Pressure, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100
A	92	93	97
B	97	98	97
D	103	108	107
E	92	95	97
F	80	84	86
G	85	89	94
J	70	77	73

Vehicle: M34 6x6
GVW: 11,536 pounds

6.0 TEST RESULTS (Contd.)

Chart No. 15

Dynamic Traction - Virgin Snow

Drawbar Pounds

Inflation Pressures, psig

<u>Group</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	2100	2450	2500
A	2375	2375	2500
B	2800	2500	2750
D	1925	1950	2300
E	2500	2525	2550
F	2250	2600	2850
G	2150	2050	2100
J	1850	1850	2175
C	2325	2575	2500

Chart No. 16 shows the ratings in percent of drawbar pounds compared to the control group C. The control was run first and last in this test and a course gradient established. The ratings take into account this course gradient (Figure No. 47) and are adjusted to it.

Chart No. 16

Dynamic Traction - Virgin Snow

Ratings

Inflation Pressures, psig

<u>Group</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100
A	109	97	100
B	132	103	110
D	88	81	108
E	113	105	102
F	100	108	114
G	95	86	84
J	81	78	87

Vehicle: TT-6 White Freightliner
 GVW: 13,740 pounds
 Mode: 4 Wheel drive

6.0 TEST RESULTS (Contd.)

Chart No. 17

Rolling Resistance - Virgin Snow

Pounds Per Ton

<u>Group</u>	<u>Inflation Pressure, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	81	106	127
A	91	85	106
B	81	86	91
D	88	85	85
E	88	89	92
F	85	92	96
G	85	86	87
J	69	84	88

Chart No. 18 shows the ratings in percent of pounds per ton rolling resistance in virgin snow as compared to control group C. (Figure No. 57)

Chart No. 18

Rolling Resistance - Virgin Snow

Ratings

<u>Group</u>	<u>Inflation Pressure, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100
A	88	119	116
B	100	119	128
D	99	120	133
E	92	116	127
F	91	113	124
G	96	118	131
J	115	121	131

Vehicle: TT-6 White Freightliner

GVW: 13,740 pounds

6.0 TEST RESULTS (Contd.)

Chart No. 19

Dynamic Traction - Hard Packed Snow

Drawbar Pounds

Inflation Pressures, psig

<u>Group</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	2000	2000	2000
A	2500	2425	2275
B	2175	2150	2100
D	2100	1950	1925
E	2000	1700	1450
F	1875	1725	1575
G	1925	1950	1625
J	1675	1850	1850
C	2200	2150	2125

Chart No. 20 shows the ratings in percent of drawbar pounds compared to the control group C. The control was run first and last in this test and a course gradient established. The ratings take into account this course gradient (Figure No. 58) and are adjusted to it.

Chart No. 20

Dynamic Traction - Hard Packed Snow

Ratings

Inflation Pressures, psig

<u>Group</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100
A	124	120	120
B	106	105	103
D	101	105	94
E	95	82	70
F	88	82	76
G	90	92	78
J	77	87	87

Vehicle: TT-6 White Freightliner
GVW: 13,740 pounds
Mode: 4 Wheel drive

6.0 TEST RESULTS (Contd.)

Chart No. 21

Rolling Resistance - Packed Snow

Pounds Per Ton

<u>Group</u>	<u>Inflation Pressure, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	64	81	89
A	49	54	80
B	41	44	45
D	45	45	62
E	45	44	44
F	37	45	54
G	36	40	47
J	37	40	43

Chart No. 22 shows the ratings in percent of drawbar pounds per ton as compared to the control group C. (Figure No. 68)

Chart No. 22

Rolling Resistance - Packed Snow

Ratings

<u>Group</u>	<u>Inflation Pressure, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100
A	122	134	110
B	136	146	150
D	130	145	130
E	130	146	150
F	142	144	139
G	143	150	147
J	141	150	152

Vehicle: TT-6 White Freightliner

GVW: 13,740 pounds

6.0 TEST RESULTS (Contd.)

Chart No. 23

Dynamic Traction - Wet Asphalt

<u>Group</u>	Drawbar Pounds		
	<u>Inflation Pressures, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	6500	6500	6500
A (1)	6000	5850	5900
A (2)	5900	6050	5900
B	6175	6400	6500
D	6450	6600	6300
E	5875	5950	5950
F	6175	6400	6050
G	6300	6400	6400
J	6500	6500	6550
C	6500	6500	6500

- (1) Directional tread mounted in designed direction.
- (2) Directional tread mounted in reverse direction.

Chart No. 24 shows the ratings in percent of drawbar pounds compared to the control group C. The control was run first and last in this test and no course change was recorded. (Figure No.69)

Chart No. 24

Dynamic Traction - Wet Asphalt
Ratings

<u>Group</u>	<u>Inflation Pressures, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100
A (1)	92	90	91
A (2)	91	93	91
B	95	98	100
D	99	102	97
E	90	92	92
F	95	98	93
G	97	98	98
J	100	100	101

- (1) Directional tread mounted in design direction.
- (2) Directional tread mounted in reverse direction.

Vehicle: M34 6x6
GVW: 11,536
Mode: 4 Wheel drive

6.0

TEST RESULTS (Contd.)

Chart No. 25

Rolling Resistance - Dry Asphalt

Pounds Per Ton

<u>Group</u>	<u>5 mph</u>			<u>40 mph</u>		
	<u>Inflation</u>	<u>Pressure</u>	<u>psig</u>	<u>Inflation</u>	<u>Pressure</u>	<u>psig</u>
	<u>50</u>	<u>35</u>	<u>15</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	37	46	61	42	53	65
A	32	40	47	35	45	53
B	42	53	64	54	65	73
D	37	41	48	43	46	55
E	31	39	53	35	44	60
F	45	51	60	53	56	68
G	41	48	55	46	54	60
J	53	61	65	60	66	68

Chart No. 26 shows the ratings in percent of pound per ton rolling resistance on dry asphalt at 5 and 40 miles per hour as compared to control group C. (Figures No. 80 and 81).

Chart No. 26

Rolling Resistance - Dry Asphalt
Ratings

<u>Group</u>	<u>5 mph</u>			<u>40 mph</u>		
	<u>Inflation</u>	<u>Pressure, psig</u>		<u>Inflation</u>	<u>Pressure, psig</u>	
	<u>50</u>	<u>35</u>	<u>15</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100	100	100	100
A	114	113	123	83	115	118
B	86	85	95	71	77	88
D	100	111	121	98	113	115
E	116	115	113	117	117	108
F	78	89	102	74	94	95
G	89	98	110	90	98	108
J	57	67	93	57	75	95

Vehicle: M-104 2 Wheel trailer
GVW: 2978 pounds

6.0 TEST RESULTS (Contd.)

Chart No. 27

Dynamic Traction - Packed Clay

<u>Group</u>	Drawbar Pounds		
	<u>Inflation Pressure, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	3600	4400	4400
A	3600	4400	4550
B	4000	4750	4750
D	3250	4050	4350
E	3350	4550	4650
F	4000	4350	4250
G	3650	4350	4800
J	4150	4400	4700
C	3600	4400	4400

Chart No. 28 shows the ratings in percent of drawbar pounds compared to the control group C. The control was run first and last in this test and no course change was recorded. (Figure No. 82)

Chart No. 28

Dynamic Traction - Packed Clay
Ratings

<u>Group</u>	<u>Inflation Pressure, psig</u>		
	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100
A	100	100	103
B	111	108	108
D	90	92	99
E	93	103	106
F	111	99	97
G	101	99	109
J	115	100	107

Vehicle: M34 6x6
GVW: 11,536 pounds
Mode: 4 Wheel drive

6.0 TEST RESULTS (Contd.)

Chart No. 29 Rolling Resistance - Hard Packed Clay

Pounds Per Ton

Inflation Pressures, psig

<u>Group</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	48	54	61
A	43	48	52
B	43	48	49
D	47	50	51
E	40	47	51
F	48	49	53
G	45	49	52
J	40	49	53
C	48	54	61

Chart No. 30 shows the ratings in percent of drawbar pounds per ton as compared to the control group C. The control group was run first and last in this test and no course change was recorded.

Chart No. 30 Rolling Resistance - Hard Packed Clay

Ratings

Inflation Pressures, psig

<u>Group</u>	<u>50</u>	<u>35</u>	<u>15</u>
C	100	100	100
A	110	111	115
B	110	111	121
D	102	107	116
E	117	113	116
F	100	109	113
G	106	109	115
J	117	109	113

Vehicle: M34 6x6
GVW: 11,536 pounds

6.0 TEST RESULTS (Contd.)

Chart No. 31 Ton Mile Per Hour Breaker Temperatures

<u>Group</u>	<u>15 psi Inflation</u>		<u>35 psi Inflation</u>	
	<u>Breaker</u>		<u>Breaker</u>	
	<u>Temperature °F</u>	<u>TMPH</u>	<u>Temperature °F</u>	<u>TMPH</u>
A	217.0	57.07	170.0	57.24
B	204.0	56.68	182.0	56.52
C	189.0	57.02	166.0	57.31
D	203.0	57.14	165.0	57.44
E	208.0	57.19	184.0	56.98
F	229.5	56.46	199.0	56.03
G	214.0	56.01	180.0	56.80
J	217.0	56.15	177.0	56.76

Figure No. 93 presents the temperatures in graph form.

6.0 TEST RESULTS (Contd.)

Braking. Measured distance to stop on dry ice and wet asphalt. Entrance speed for dry ice was 9 miles per hour and for wet asphalt 30 miles per hour. Figures No. 94 and No. 95 display the results in graphic form.

Chart No. 32

Braking

<u>Group</u>	<u>Dry Ice</u>		<u>Wet Ashpalt</u>	
	<u>Avg. Feet</u>	<u>Rating</u>	<u>Avg. Feet</u>	<u>Rating</u>
C	71	100	79	100
A	74	100	87	93
B	73	100	89	98
D	71	104	89	92
E	60	120	90	93
F	65	112	85	96
G	69	108	84	95
J	75	95	84	100
C	75	100	85	100

The two figures for group C, the control group, form the course gradient to which all other test groups are compared. Figures No. 94 and No. 95 show the sequence in which the groups were run.

Vehicle: M34 6x6
GVW: 11,536 pounds
Mode: 4 Wheel braking

6.0 TEST RESULTS (Contd.)

Stone Retention

Groups A, E and F retained stones during this phase of testing.

Groups B, C, D, G and J show no signs of stone retention.

Group E picked up and retained in the tread pattern nine stones in the 3/8" diameter size. Group F retained one of the 3/8" diameter size and Group A retained one each of the 3/8" diameter and 3/4" diameter sizes.

Rock Cutting

Chart No. 33 gives a description of the number and size of cuts incurred during the 1000 mile rock cutting exercise, gives sipe condition where applicable, enlarges on stone retention and points out other significant results to the tread elements and sidewalls.

6.0 TEST RESULTS (Contd.)

Chart No. 33

Results of Rock Cutting Test

Tire Group	Sidewall	Results of Rock Cutting Test			Stone Retention	Other
		Significant Cuts	Sipe Condition			
A	No Action	8 - 1/4" x 1/8" deep	No Sipes	None	None	Chipping on heel of lugs.
B	No Action	1 - 1/2" x 1/8" deep 1 - 1" x 1/8" deep 1 - 1 1/2" x 1/8" deep	End tears on 3 sipes	1 - 1/8" and 1 - 3/16" in sipes		Slight chipping on corners of lugs
C	No Action	1 - 1" x 1/8" deep 1 - 1 1/4" x 1/8" deep 16 - 1/4" x 1/8" deep	No Sipes	None		Slight chipping on rib edges.
D	No Action	1 - 1/2" x 1/4" deep 1 - 5/8" x 1/4" deep 1 - 3/4" x 1/8" deep 1 - 1" x 1/4" deep 7 - 3/8" to 1/2" x 1/8" deep	Chipping on edges and end tears on 80%	12 - 1/8" or smaller in sipes		Erosion and chipping on leading edges of shoulder lugs.
E	No Action	1 - 3/8" x 3/8" deep 1 - 3/4" x 3/16" deep 1 - 3/4" x 1/8" deep 1 - 3/8" x 1/8" deep 1 - 1/4" x 3/16" deep 1 - 1/2" x 3/16" deep 1 - 1" x 1/4" deep	All Open 17 end tears. Chipping severe on edges	26 - 3/8" to 5/8" diameter stones in tread. Sand particles in all sipes.		Slight chipping on lug edges.
F	No Action	1 - 1 1/2" x 1/4" deep 38 - 3/8" x 1/8" deep 3 - 3/4" x 1/4" deep 94 - chips and cuts approximately 1/4" x 1/16" to 1/8" deep	No Sipes	None		Tearing at the corners of the heel relief grooves and outside lug relief grooves.

6.0 TEST RESULTS (Contd.)

Results of Rock Cutting Test (Contd.)

Chart No. 33

Tire Group	Sidewall	Significant Cuts	Sipe Condition	Stone Retention	Other
G	1-1/4" long to steel 7" from shoulder.	2 - 1/2"x1/8" deep.	11 - end tears circumferential sipes opened up - radial sipes O.K.	13 - 1/16" to 1/8" in sipes.	Chipping on sipe edges.
J	No action.	24 - 1/4" to 1/2" long by 1/16" to 1/8" deep.	All sipes open. Small end tears and some edge chipping.	14 - 1/16" to 1/8" in sipes.	1/4" retread left at feathered shoulder area on one side of one tire only.

Each two tire group was run for 1000 miles on the NATC imbedded and loose rock Serpentine Course. After each 333 mile increment, the tire groups were rotated to different axle position giving 333 miles in each of the three positions on the test bed. At the conclusion of this test phase, the shore "A" hardness was measured on each test tire and an x-ray of the tread area on one tire from each group. X-ray prints appear in the Appendix.

Shore "A" Hardness Results

Group	A	B	C	D	E	F	G	J
Durometer	68	68	68	66	68	69	66	66
Ambient Temp. °F	80	80	82	82	81	82	81	81

6.0 TEST RESULTS (Contd.)

Group	Chart No. 34		Footprint - Length and Width			Infl. psig	Length x Width		Weight Pounds	Infl. psig	Weight Pounds	Length x Width	
	Infl. psig	Weight Pounds	Infl. psig	Length Inches	Width Inches		Group	Length Inches				Width Inches	Length Inches
NDCC STD MIL- ITARY BIAS	50	1484	50	8.75	4.79	50	D	7.40	1484	50	1484	7.40	5.90
	35	1484	35	9.20	5.20	35		8.05	1484	35	1484	8.05	6.30
	15	1484	15	11.45	6.35	15		11.55	1484	15	1484	11.55	7.05
	50	2090	50	9.65	5.32	50		8.60	2090	50	2090	8.60	6.80
	35	2090	35	10.50	5.85	35		10.00	2090	35	2090	10.00	7.20
	15	2090	15	13.25	7.15	15		14.30	2090	15	2090	14.30	6.70
R2A BIAS	50	1484	50	7.76	4.98	50	E	7.75	1484	50	1484	7.75	6.30
	35	1484	35	8.20	5.34	35		8.90	1484	35	1484	8.90	6.60
	15	1484	15	9.54	6.07	15		11.65	1484	15	1484	11.65	6.61
	50	2090	50	8.90	5.67	50		9.00	2090	50	2090	9.00	6.61
	35	2090	35	9.52	5.93	35		10.20	2090	35	2090	10.20	6.61
	15	2090	15	11.50	6.69	15		14.15	2090	15	2090	14.15	6.61
A	50	1484	50	6.78	5.06	50	F	7.70	1484	50	1484	7.70	6.45
	35	1484	35	8.50	5.80	35		8.85	1484	35	1484	8.85	6.45
	15	1484	15	11.75	7.00	15		11.70	1484	15	1484	11.70	6.45
	50	2090	50	8.85	6.27	50		9.10	2090	50	2090	9.10	6.30
	35	2090	35	9.30	6.84	35		10.50	2090	35	2090	10.50	6.50
	15	2090	15	13.90	7.05	15		14.30	2090	15	2090	14.30	6.50
B	50	1484	50	7.15	5.55	50	G	7.85	1484	50	1484	7.85	5.60
	35	1484	35	8.20	5.86	35		9.00	1484	35	1484	9.00	6.55
	15	1484	15	10.60	6.65	15		12.30	1484	15	1484	12.30	7.31
	50	2090	50	8.70	6.14	50		9.10	2090	50	2090	9.10	6.75
	35	2090	35	9.90	6.68	35		10.55	2090	35	2090	10.55	7.33
	15	2090	15	12.03	6.83	15		14.95	2090	15	2090	14.95	7.33
C	50	1484	50	7.20	4.95	50	J	8.40	1484	50	1484	8.40	5.00
	35	1484	35	8.42	5.30	35		9.45	1484	35	1484	9.45	5.64
	15	1484	15	11.60	5.90	15		12.85	1484	15	1484	12.85	7.23
	50	2090	50	8.50	5.45	50		9.80	2090	50	2090	9.80	6.42
	35	2090	35	10.18	5.80	35		11.10	2090	35	2090	11.10	6.23
	15	2090	15	14.30	6.70	15		15.84	2090	15	2090	15.84	7.23

6.0 TEST RESULTS (Contd.)

Chart No. 35

Length to Width Ratios

<u>Group</u>	<u>Infl. psig</u>	<u>L/W Ratio 1484 Lbs.</u>	<u>Rating</u>	<u>L/W Ratio 2090 Lbs.</u>	<u>Rating</u>
NDCC STD	15	1.80	100	1.85	100
MILITARY	35	1.77	100	1.79	100
BIAS	50	1.83	100	1.81	100
R2A	15	1.57	87	1.72	93
BIAS	35	1.54	87	1.61	90
	50	1.56	85	1.57	87
A	15	1.68	93	1.97	106
	35	1.47	83	1.36	76
	50	1.34	73	1.41	78
B	15	1.59	88	1.76	95
	35	1.40	79	1.48	83
	50	1.29	70	1.42	79
C	15	1.97	109	2.13	115
	35	1.59	90	1.76	98
	50	1.45	79	1.60	88
D	15	1.64	86	2.13	115
	35	1.28	72	1.39	78
	50	1.25	68	1.26	70
E	15	1.76	98	2.14	116
	35	1.35	76	1.54	86
	50	1.23	67	1.36	75
F	15	1.81	100	2.20	119
	35	1.37	76	1.62	91
	50	1.19	65	1.44	80
G	15	1.68	93	2.04	110
	35	1.37	77	1.44	80
	50	1.40	76	1.35	75
J	15	1.78	99	2.19	118
	35	1.68	95	1.78	100
	50	1.68	92	1.53	85

6.0 TEST RESULTS (Contd.)

Footprints - Spring Rates & Length to Width

Ratios - Rated Against Standard Military NDCC Bias

Chart No. 36

Spring Rate Ratings Pounds/1 inch Deflection
Group

Infl. Press. psig	NDCC STD. MIL.	R2A BIAS	A	B	C	D	E	F	G	J
50 Improvement %	2125	2500 -18	1750 +18	1750 +18	1500 +29	1750 +18	1750 +18	1875 +12	2000 +6	1750 +18
35 Improvement %	1375	2150 -56	1250 +9	1375 --	1167 +15	1417 -3	1250 +9	1250 +9	1250 +9	1325 +4
15 Improvement %	813	1050 -29	833 -2	950 -17	813 --	687 +15	700 +14	813 --	792 +3	800 +2

Figures 70 through 79 show the graphic representation of spring rates.

6.0 TEST RESULTS (Contd.)

Chart No. 37

Footprints - Gross and Net Square Inches

Group	Infl. Weight psig	Gross Area Sq. In.	Pounds		Net Area		Group	Infl. Weight psig	Gross Area Sq. In.	Pounds		Net Area		Group	Infl. Weight psig	Gross Area Sq. In.	Pounds	
			Per Sq. In.	Gross	Per Sq. In.	Gross				Per Sq. In.	Gross	Per Sq. In.	Gross					
																	Per Sq. In.	Net
NDCC STD. MIL. BIAS	15	1484	60.9	24.4	34.9	42.5	D	15	1484	68.9	21.5	43.7	34.0		15	1484	68.9	21.5
	35	1484	36.3	40.9	21.9	67.8		35	1484	40.9	36.3	26.4	56.2		35	1484	40.9	36.3
	50	1484	31.4	47.3	20.1	73.8		50	1484	34.1	43.5	22.4	66.3		50	1484	34.1	43.5
	15	2090	82.9	33.2	46.2	45.2		15	2090	93.1	22.5	57.7	36.2		15	2090	93.1	22.5
	35	2090	49.5	42.2	29.4	71.1		35	2090	57.9	36.1	37.2	56.2		35	2090	57.9	36.1
R2A BIAS NDCC	50	2090	39.7	52.6	24.5	85.3	E	50	2090	46.7	44.8	31.1	67.2		50	2090	46.7	44.8
	15	1484	49.3	30.1	29.7	50.0		15	1484	70.6	21.0	38.6	38.5		15	1484	70.6	21.0
	35	1484	34.0	43.7	20.9	71.0		35	1484	48.7	30.5	27.4	54.2		35	1484	48.7	30.5
	50	1484	35.5	48.7	19.2	77.3		50	1484	40.0	37.1	20.9	71.0		50	1484	40.0	37.1
	15	2090	69.5	30.1	40.5	51.6		15	2090	92.0	22.7	53.4	39.1		15	2090	92.0	22.7
A	35	2090	47.2	44.3	28.2	74.1	F	35	2090	60.6	34.5	34.3	60.9		35	2090	60.6	34.5
	50	2090	40.3	51.9	24.6	85.0		50	2090	50.1	41.7	27.1	77.1		50	2090	50.1	41.7
	15	1484	68.5	21.7	35.2	42.2		15	1484	70.2	21.1	45.2	32.8		15	1484	70.2	21.1
	35	1484	42.7	34.8	24.5	60.6		35	1484	48.0	30.9	32.9	45.1		35	1484	48.0	30.9
	50	1484	32.4	45.8	19.8	75.0		50	1484	38.3	38.8	27.1	54.8		50	1484	38.3	38.8
B	15	2090	90.8	23.0	48.4	43.2	G	15	2090	89.8	23.3	58.2	35.9		15	2090	89.8	23.3
	35	2090	57.6	36.3	32.0	65.3		35	2090	61.8	33.8	41.6	50.2		35	2090	61.8	33.8
	50	2090	46.6	44.9	26.6	78.6		50	2090	51.4	40.7	35.0	59.7		50	2090	51.4	40.7
	15	1484	63.2	23.5	37.1	40.0		15	1484	77.6	19.1	42.2	35.2		15	1484	77.6	19.1
	35	1484	41.0	36.2	23.6	62.9		35	1484	47.1	31.5	27.8	53.4		35	1484	47.1	31.5
C	50	1484	33.6	44.2	19.0	78.1	J	50	1484	36.3	40.9	21.5	69.0		50	1484	36.3	40.9
	15	2090	81.6	25.6	48.0	43.5		15	2090	97.5	21.4	56.4	37.1		15	2090	97.5	21.4
	35	2090	60.5	34.6	35.8	58.4		35	2090	62.6	33.4	37.2	56.2		35	2090	62.6	33.4
	50	2090	45.6	45.8	26.7	78.3		50	2090	48.5	43.1	29.2	71.6		50	2090	48.5	43.1
	15	1484	59.0	25.2	39.9	37.2		15	1484	72.9	20.4	42.2	35.2		15	1484	72.9	20.4
	35	1484	32.3	45.9	25.2	58.9		35	1484	40.4	36.7	24.4	60.8		35	1484	40.4	36.7
	50	1484	30.6	48.5	21.3	69.7		50	1484	32.4	45.8	20.7	71.7		50	1484	32.4	45.8
	15	2090	81.4	25.7	53.8	38.9		15	2090	98.1	21.3	58.9	35.5		15	2090	98.1	21.3
	35	2090	50.8	41.1	35.3	59.2		35	2090	58.5	35.7	35.2	59.4		35	2090	58.5	35.7
	50	2090	39.7	52.6	27.2	76.8		50	2090	47.0	44.5	29.4	71.1		50	2090	47.0	44.5

7.0

METHODOLOGY

7.1 Lateral stability

"J" and "S" turn maneuvers were used to compare the various construction and tread design capabilities. Diagrams 1 and 2 graphically demonstrate the technique used. The test vehicle enters the test pattern arranged to give a constant radius in the case of "J" turns and two tangent and opposite constant radii in the "S" turn. Vehicle speed is increased in one mile per hour increments until loss of control or full lock steering is achieved. Deviation of front and rear wheels from the test pattern is measured and these measurements plus maximum controlled speed are the criteria for lateral stability.

7.2 Tractive force

A dynamometer vehicle is secured by drawbar or cable to the rear axle of the test vehicle. A constant speed is achieved for each environment and the test vehicle, maintaining constant wheel speed, is brought to zero ground speed and the relationship between wheel speed and ground speed, differential interface velocity, is recorded on a Honeywell XXY plotter. Several test runs are recorded for each inflation pressure in each environment and an average determined. These averages are tabulated in each of the environmental segments in the Test Results section of this report.

7.2.1 Prepared Sand

A level course, 20 feet wide by 500 feet long, was built and harrowed to a depth of approximately 15 inches. On each individual run one inch plate penetrometer and cone penetrometer readings were taken in both rear test tire tracks and in the undisturbed areas outside of the tracks. Track depth and width, vehicle attitude at the end of each run and wheel hop frequency were also recorded. Moisture content to a depth of 18 inches was maintained below .5% and the test course was harrowed after each series of runs.

7.2.2 Prepared Mud

An 18 inch deep course was prepared with a 20-24% moisture content. Track depth and width was measured

7.0 METHODOLOGY (Contd.)

7.2 Tractive force (Contd.)

7.2.2 Prepared Mud (Contd.)

each pass and cone and plate penetrometer readings taken. The course was worked and leveled after each series of runs.

7.2.3 Packed clay was run on a course with compaction between 180 and 220+ psi.

7.2.4 Virgin snow was run in fresh snow four to six inches deep over a compacted snow area.

7.2.5 Packed snow was run on two to four inches of compacted new snow with a compaction of 140 to 200 psi.

7.2.6 Dry ice was run on the specially prepared ice surface of the Squaw Valley, California Olympic ice arena. Surface temperature was between 23 and 25°F.

7.2.7 Wet asphalt was run on an SAE #5 surface.

7.3 Braking Efficiency

Wet asphalt was run on an SAE #5 surface with an entrance speed of 30 miles per hour. Dry ice braking was run on the same surface as dry ice traction with an entrance speed of 9 miles per hour. Both of these braking tests were run in a 4-wheel braking mode.

7.4 All rolling resistance measurements were taken in conjunction with tractive effort testing on the same surfaces and all were run at 5 miles per hour.

7.5 Ton Mile Per Hour Breaker Temperature

Each group of tires was run separately using two rear axle tires as the test samples. The test vehicle was run at a constant 35 miles per hour after an initial warm up period. An electric digital temperature recorder was attached to a hand probe and this probe was inserted in the tread shoulder to

7.0 METHODOLOGY (Contd.)

7.5 Ton Mile Per Hour Breaker Temperature (Contd.)

the depth of the belt. Runs were repeated until a stabilized temperature was reached.

7.6 Stone Retention and Rock Cutting

7.6.1 Stone Retention

Three size grades of fractured granite were used for this test; 3/8", 3/4" and 1-1/2". A course was prepared allowing three complete revolutions of the test tire in each size of stone. Three passes at 15 miles per hour were made, recording any retained stones after each pass.

7.6.2 Rock Cutting

Two tires of each of the test groups were run 333 miles in each of the three axle positions over a course of loose and imbedded granite at an average speed of 26 miles per hour. Cuts, tears, abrasions and general tread element conditions were recorded.

7.7 The static tests were conducted as follows:

7.7.1 Spring Rates

The test tire was installed on the rear axle of the test vehicle, a Loadometer platform scale placed under it and the opposite tire raised to create a level contact with the platform scale. Zero was obtained by inserting a sheet of paper under the test tire and raising the tire until the paper could be removed with a slight drag. The tire was lowered onto the scale and the height of a preselected point on the rim measured at each 250 pound increment.

7.7.2 Footprint Analysis

Using the same system as for the spring rate measurements, a section of the test tire tread was covered with printers ink, the tire lowered onto a piece of clean white paper

7.0 METHODOLOGY (Contd.)

7.7 The static tests were conducted as follows: (Contd.)

7.7.2 Footprint Analysis (Contd.)

to the proper loading, raised and the recorded print removed. The length and width, gross area and net area were measured and recorded.

7.7.3 An x-ray was taken of a section of the tread on one tire from each test group.

Nevada Automotive Test Center

Project: 20-17-30

DIAGRAM NO. 1

"J" TURN

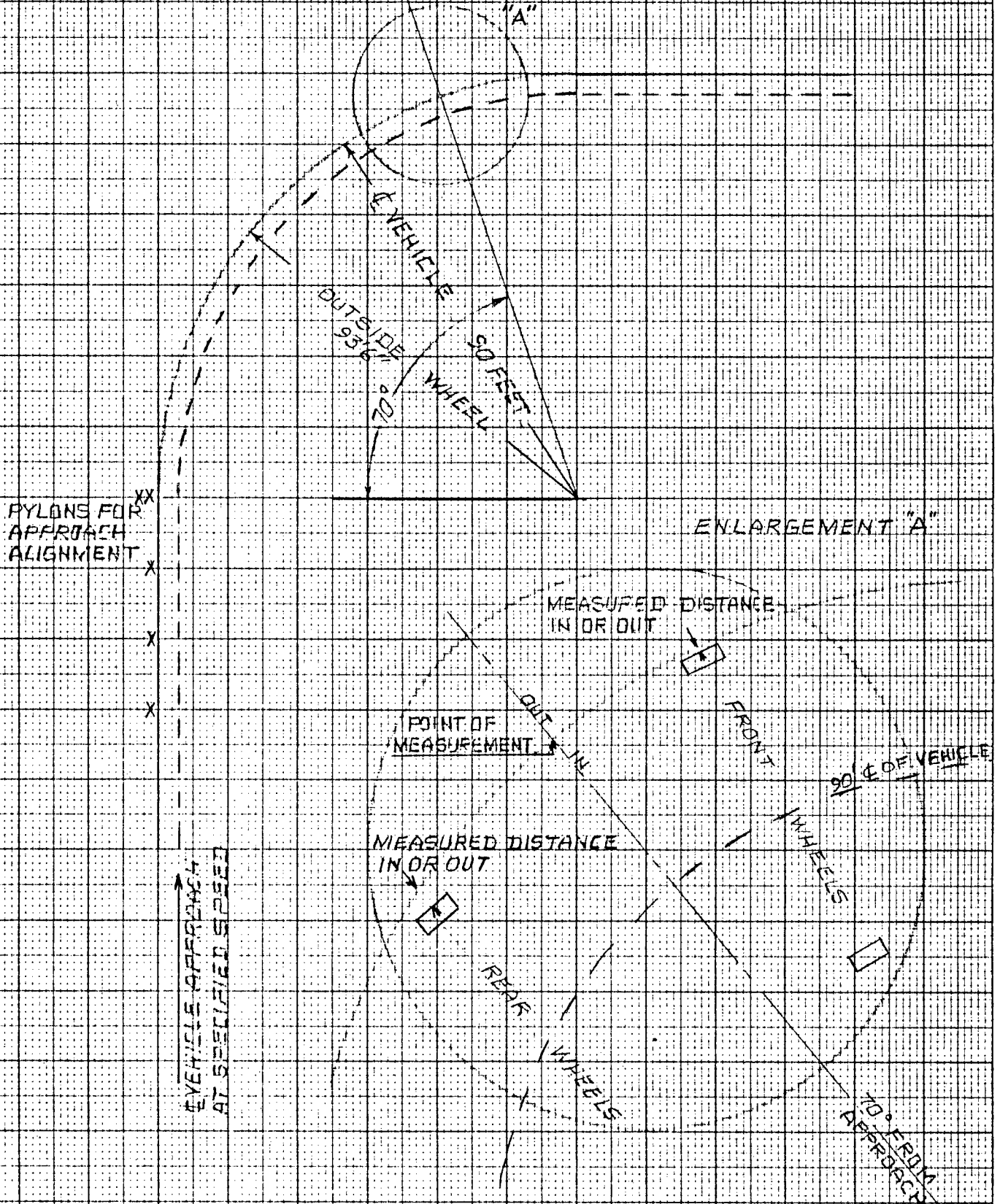
WET ASPHALT

Location: PROVING GROUND

Date:

Test By: JED

Data By: JED



Nevada Automotive Test Center

Project 20-17-30

DIAGRAM NO. 2

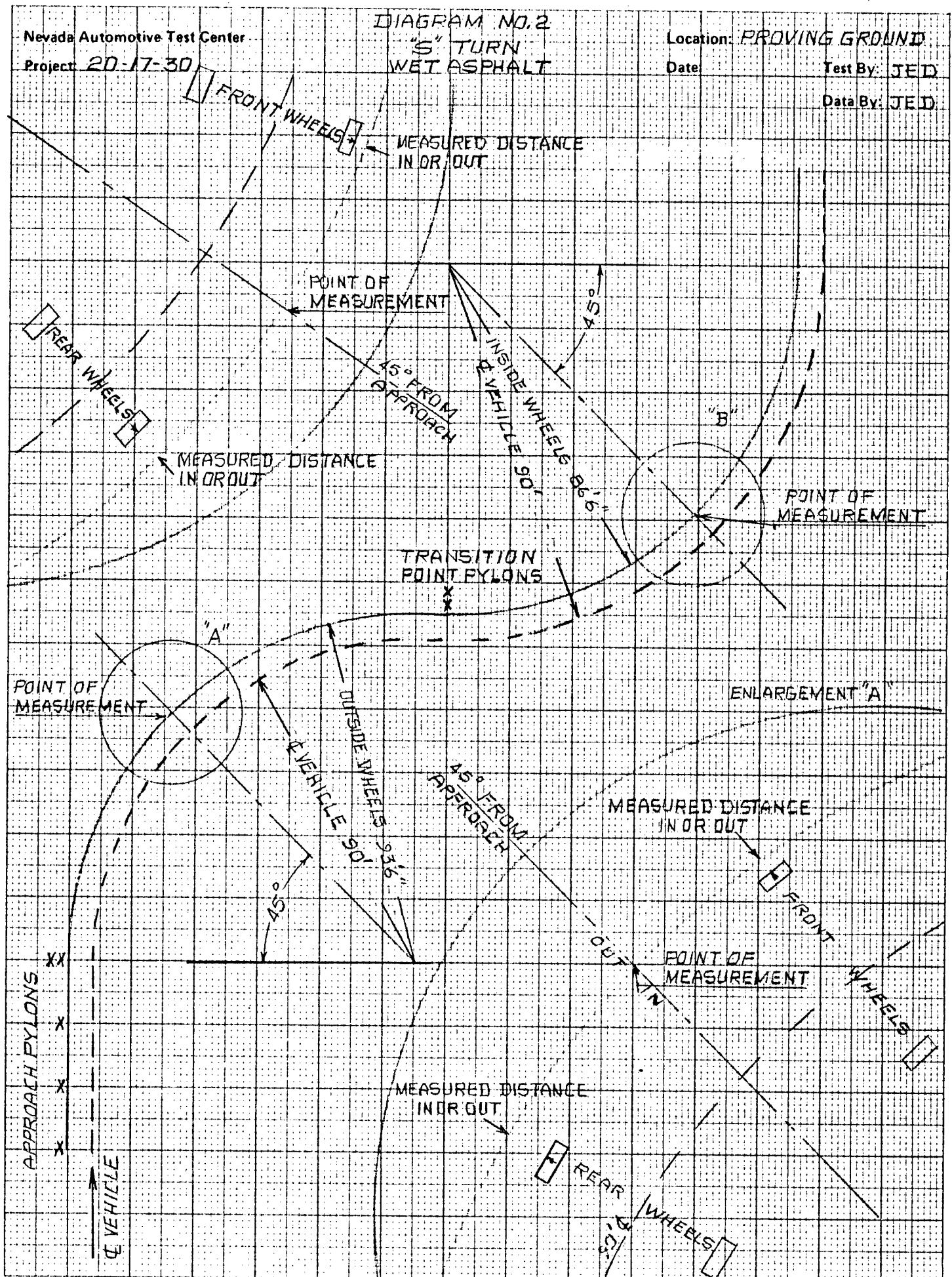
"S" TURN
WET ASPHALT

Location: PROVING GROUND

Date:

Test By: JED

Data By: JED



8.0 TEST MATERIAL

The dynamic studies of this test project were done on eight groups of 9.00R20 radial ply tires. The static studies were done on the same eight groups plus two groups of 9.00-20 bias ply tires. Each of the radial ply tire groups was given a letter designation which applies throughout this report. Following is a description of these various groups.

<u>Group</u>	<u>Manufacturer</u>	<u>Tread or Construction Designation</u>
A	Michelin	XL Ply Rating 14
B	Michelin	XB Ply Rating 14
C	Michelin	XY Ply Rating 14
D	Goodyear	Unisteel L-1 Ply Rating 12
E	Goodrich	Milesaver Radial Steel HDB Ply Rating 12
F	Uniroyal	Max TB-3 Ply Rating 14
G	Goodyear	Unisteel L-1 Carcass with a Lodi retread Ply Rating 12
J	Michelin	XZZ Carcass with a Lodi retread Ply Rating 12

The description of the two additional groups of bias ply tires specified in contract Modification P00003 for static tests is as follows:

<u>Group</u>	<u>Manufacturer</u>	<u>Tread or Construction Designation</u>
Standard Military Bias Ply	Firestone	Non-Directional Cross-Country (NDCC) Ply Rating 8
R2A Bias Ply	Firestone	Military NDCC with circumferential grooves Ply Rating 8

8.0

TEST MATERIAL (Contd.)

Tire Measurements and Weights

<u>Group</u>	<u>Outside Diameter At Crown, Inches</u>	<u>Cross Section, Inches</u>	<u>Tread Profile, Inches</u>	<u>Tread Arc Width Inches</u>	<u>Shore "A" Hardness</u>	<u>Unmounted Weight, Pounds</u>
A	40.46	10.10	13.25	7.49	68	106.4
B	40.49	10.17	13.00	7.33	67	104.2
C	40.20	10.12	12.75	7.30	68	98.1
D	40.32	10.30	13.50	7.58	68	108.7
E	40.15	10.04	14.75	7.01	65	103.5
F	40.21	9.60	15.25	6.90	70	92.8
G	40.38	10.25	12.75	7.76	68	108.6
J	40.55	10.20	11.25	7.79	65	100.6
STD. MIL. BIAS PLY NDCC	39.79	10.33	7.75	6.00	65	73.3
R2A BIAS PLY MODIFIED NDCC	40.30	10.13	8.75	6.13	68	85.3

9.0

TEST VEHICLE WEIGHT

M34

3 axles

6 wheels

Specified cross-country GVW: For dual rear wheel operation.

Front Axle 5601#

#2 Axle 5587#

#3 Axle 5587#

Specified cross-country GVW: For single rear wheel operation

Front Axle 5601#

#2 Axle 2968#

#3 Axle 2968#

Specified per wheel loads
for single wheel operationRight Front 2800.5#Left Front 2800.5##2 Axle Right 1484.0##2 Axle Left 1484.0##3 Axle Right 1484.0##3 Axle Left 1484.0#

11,537.0#

Actual test loads with
driver and full fuel tank

Right Front 2760#

Left Front 2765#

#2 Axle Right 1510#

#2 Axle Left 1540#

#3 Axle Right 1490#

#3 Axle Left 1455#

11,520#

9.0

TEST VEHICLE WEIGHT (Contd.)

TT-6 White Freightliner

Actual test load with driver and full fuel tank.

Rt. Front	4030 pounds
Lt. Front	4100 pounds
#2 Axle Rt.	1330 pounds
#2 Axle Lt.	1590 pounds
#3 Axle Rt.	1280 pounds
#3 Axle Lt.	1410 pounds

M-104 2 Wheel Trailer

Test loaded to 1484 pounds per tire with 10 pounds tongue weight.

Total GVW 2978 pounds.

TEST DATA

Project 20-17-30

TEST DATA

Figure No. 1

Dynamic Traction Summary - Dry Sand

Nevada Automotive Test Center		DYNAMIC TRACTION SUMMARY		Location: SAND MOUNTAIN, NEVADA	
Project: 20-17-30		DRY SAND		Date: 9-19/26-73	
		DRAWBAR POUNDS PULL AT PEAK TRACTION		Test By: WHS	
		312 MPH		Data By: WHS	
		FIGURE NO. 1			

RATING @ 10 PSIG	RATING @ 15 PSIG	AVG. DB. LBS. @ 10 PSIG	AVG. DB. LBS. @ 15 PSIG	CODE	AMB. °F	SURF. °F
100	100	1000	1000	D	64-92	100-118
1350	1350	1350	1350	A	70-88	72-106
1775	1775	1775	1775	B	74	78
1800	1800	1800	1800	C	77-80	80-94
1750	1750	1750	1750	E	55-80	54-74
1800	1800	1800	1800	F	68-71	63-72
2100	2100	2100	2100	G	55-78	54-74
1950	1950	1950	1950	J	61	60
1175	1175	1175	1175	D	70	86

TEST DATA

Figures 2 through 10

Dynamic Traction - Dry Sand

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY SAND

GROUP: D RUN NO. 1

4 WHEEL DRIVE

3.2 MPH

FIGURE NO. 2

Location: SAND MOUNTAIN, NEVADA

Date: 9-19-73

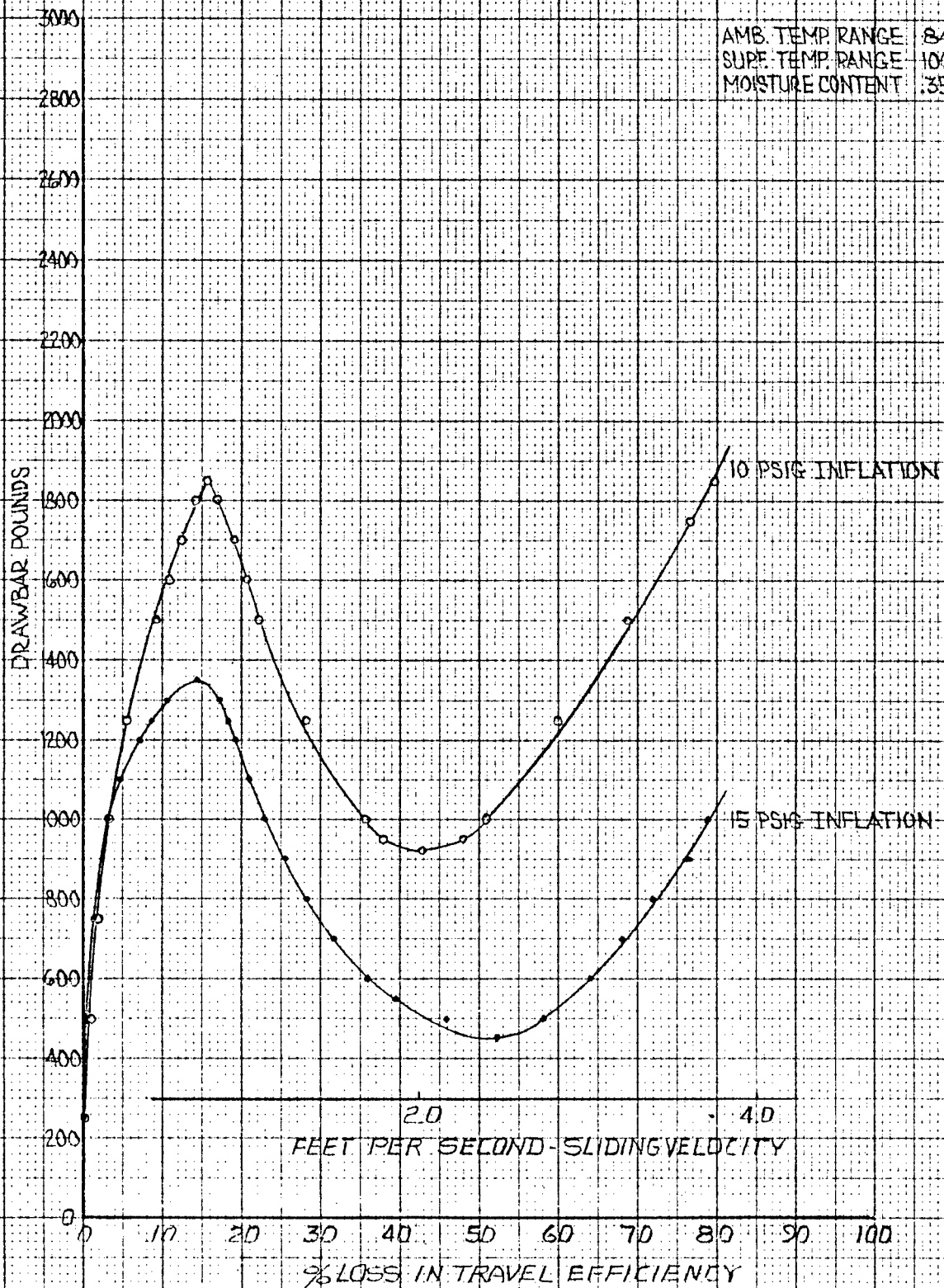
Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 84-92°F

SURF. TEMP. RANGE 100-118°F

MOISTURE CONTENT .35-.45%



TEST DATA

DRY SAND

Date: 9-19-73 Time: 10:45 AM Test Vehicle: M-34 6 WHEEL DRIVE
 Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: D
 Inflation, psig: 15 Ambient Temp. °F.: 84 Surface Temp. °F.: 100
 Relative Humidity %: 42 Wind Speed, mph: 2 Wind Direction: W

Sand Moisture Content, % (at course location): 200 Feet: .40 .35 .45
 400 Feet: .35 .40 .45

		Left Rear				Right Rear			
Run Number:		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>3.25</u>	<u>-</u>	<u>3.75</u>	<u>2.50</u>	<u>3.00</u>	<u>3.25</u>	<u>2.75</u>	<u>3.25</u>
Tire Track Width, Ins.:		<u>22.00</u>	<u>-</u>	<u>22.00</u>	<u>22.50</u>	<u>21.00</u>	<u>-</u>	<u>20.00</u>	<u>22.50</u>
Cone Penetrometer Readings in Track	3"	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>28</u>	<u>20</u>	<u>21</u>	<u>20</u>
	6"	<u>55</u>	<u>65</u>	<u>55</u>	<u>60</u>	<u>61</u>	<u>60</u>	<u>55</u>	<u>65</u>
	9"	<u>90</u>	<u>85</u>	<u>80</u>	<u>85</u>	<u>70</u>	<u>85</u>	<u>85</u>	<u>90</u>
	12"	<u>125</u>	<u>120</u>	<u>90</u>	<u>100</u>	<u>110</u>	<u>105</u>	<u>115</u>	<u>125</u>
	15"	<u>05</u>	<u>185</u>	<u>145</u>	<u>05</u>	<u>145</u>	<u>05</u>	<u>05</u>	<u>220</u>
	18"	<u>-</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>-</u>	<u>-</u>	<u>05</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>20</u>	<u>25</u>	<u>25</u>	<u>25</u>	<u>30</u>	<u>20</u>	<u>25</u>	<u>23</u>
	6"	<u>38</u>	<u>55</u>	<u>45</u>	<u>40</u>	<u>47</u>	<u>25</u>	<u>45</u>	<u>65</u>
	9"	<u>51</u>	<u>65</u>	<u>55</u>	<u>55</u>	<u>60</u>	<u>70</u>	<u>45</u>	<u>45</u>
	12"	<u>70</u>	<u>75</u>	<u>65</u>	<u>60</u>	<u>75</u>	<u>75</u>	<u>50</u>	<u>65</u>
	15"	<u>87</u>	<u>90</u>	<u>75</u>	<u>75</u>	<u>77</u>	<u>100</u>	<u>185</u>	<u>65</u>
	18"	<u>155</u>	<u>215</u>	<u>105</u>	<u>140</u>	<u>88</u>	<u>05</u>	<u>05</u>	<u>05</u>
	21"	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	3"	<u>17</u>	<u>21</u>	<u>30</u>	<u>20</u>	<u>15</u>	<u>29</u>	<u>30</u>	<u>25</u>
	6"	<u>45</u>	<u>57</u>	<u>60</u>	<u>55</u>	<u>67</u>	<u>54</u>	<u>52</u>	<u>49</u>
	9"	<u>78</u>	<u>76</u>	<u>100</u>	<u>95</u>	<u>88</u>	<u>109</u>	<u>86</u>	<u>88</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>25</u>	<u>31</u>	<u>25</u>	<u>26</u>	<u>28</u>	<u>28</u>	<u>38</u>	<u>29</u>
	6"	<u>60</u>	<u>62</u>	<u>41</u>	<u>45</u>	<u>49</u>	<u>62</u>	<u>50</u>	<u>42</u>
	9"	<u>69</u>	<u>94</u>	<u>60</u>	<u>73</u>	<u>65</u>	<u>84</u>	<u>56</u>	<u>55</u>

Run Number: 1 2 3 4
 Test Vehicle Attitude at Stall, % - Front Up: - - - -
 Front Down: - 1.0 - -

Tire Hop Frequency, Hz 3.0

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SANDDate: 9-19-73 Time: 12:50 PM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: DInflation, psig: 10 Ambient Temp. °F.: 92 Surface Temp. °F.: 118Relative Humidity %: 25 Wind Speed, mph: 7 Wind Direction: SW

		Sample Depth, Inches
		<u>3</u> <u>9</u> <u>18</u>
Sand Moisture Content, % (at course location):	200 Feet:	<u>.40</u> <u>.35</u> <u>.45</u>
	400 Feet:	<u>.35</u> <u>.40</u> <u>.45</u>

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>3.75</u>	<u>4.50</u>	<u>4.75</u>	<u>5.50</u>	<u>3.50</u>	<u>5.00</u>	<u>4.25</u>	<u>5.00</u>
Tire Track Width, Ins.:		<u>23.25</u>	<u>23.00</u>	<u>21.50</u>	<u>23.50</u>	<u>23.50</u>	<u>22.50</u>	<u>20.00</u>	<u>20.00</u>
Cone Penetrometer Readings in Track	3"	<u>30</u>	<u>30</u>	<u>15</u>	<u>35</u>	<u>35</u>	<u>30</u>	<u>5</u>	<u>30</u>
	6"	<u>60</u>	<u>65</u>	<u>55</u>	<u>75</u>	<u>75</u>	<u>70</u>	<u>55</u>	<u>70</u>
	9"	<u>90</u>	<u>80</u>	<u>55</u>	<u>80</u>	<u>85</u>	<u>70</u>	<u>75</u>	<u>95</u>
	12"	<u>175</u>	<u>175</u>	<u>105</u>	<u>145</u>	<u>155</u>	<u>145</u>	<u>85</u>	<u>235</u>
	15"	<u>05</u>	<u>05</u>	<u>275</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>175</u>	<u>05</u>
	18"	<u>-</u>	<u>-</u>	<u>05</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>05</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>15</u>	<u>5</u>	<u>5</u>	<u>15</u>	<u>17</u>	<u>20</u>	<u>5</u>	<u>15</u>
	6"	<u>30</u>	<u>15</u>	<u>17</u>	<u>35</u>	<u>33</u>	<u>35</u>	<u>30</u>	<u>20</u>
	9"	<u>35</u>	<u>37</u>	<u>25</u>	<u>35</u>	<u>37</u>	<u>45</u>	<u>55</u>	<u>55</u>
	12"	<u>35</u>	<u>45</u>	<u>15</u>	<u>45</u>	<u>37</u>	<u>45</u>	<u>50</u>	<u>70</u>
	15"	<u>55</u>	<u>75</u>	<u>15</u>	<u>55</u>	<u>35</u>	<u>50</u>	<u>45</u>	<u>80</u>
	18"	<u>245</u>	<u>285</u>	<u>105</u>	<u>05</u>	<u>145</u>	<u>195</u>	<u>55</u>	<u>145</u>
	21"	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>285</u>	<u>275</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>05</u>	<u>05</u>
Plate Penetrometer Readings in Track, psi	3"	<u>37</u>	<u>31</u>	<u>36</u>	<u>21</u>	<u>40</u>	<u>34</u>	<u>30</u>	<u>34</u>
	6"	<u>52</u>	<u>55</u>	<u>51</u>	<u>48</u>	<u>57</u>	<u>65</u>	<u>71</u>	<u>57</u>
	9"	<u>88</u>	<u>101</u>	<u>93</u>	<u>74</u>	<u>81</u>	<u>82</u>	<u>99</u>	<u>87</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>23</u>	<u>19</u>	<u>27</u>	<u>25</u>	<u>25</u>	<u>23</u>	<u>22</u>	<u>23</u>
	6"	<u>31</u>	<u>37</u>	<u>48</u>	<u>48</u>	<u>44</u>	<u>39</u>	<u>47</u>	<u>40</u>
	9"	<u>44</u>	<u>51</u>	<u>57</u>	<u>62</u>	<u>70</u>	<u>51</u>	<u>66</u>	<u>60</u>

	Run Number:	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Test Vehicle Attitude at Stall, % - Front Up:		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:		<u>1.0</u>	<u>1.0</u>	<u>1.5</u>	<u>1.0</u>

Tire Hop Frequency, Hz 2.2

Comments: _____

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

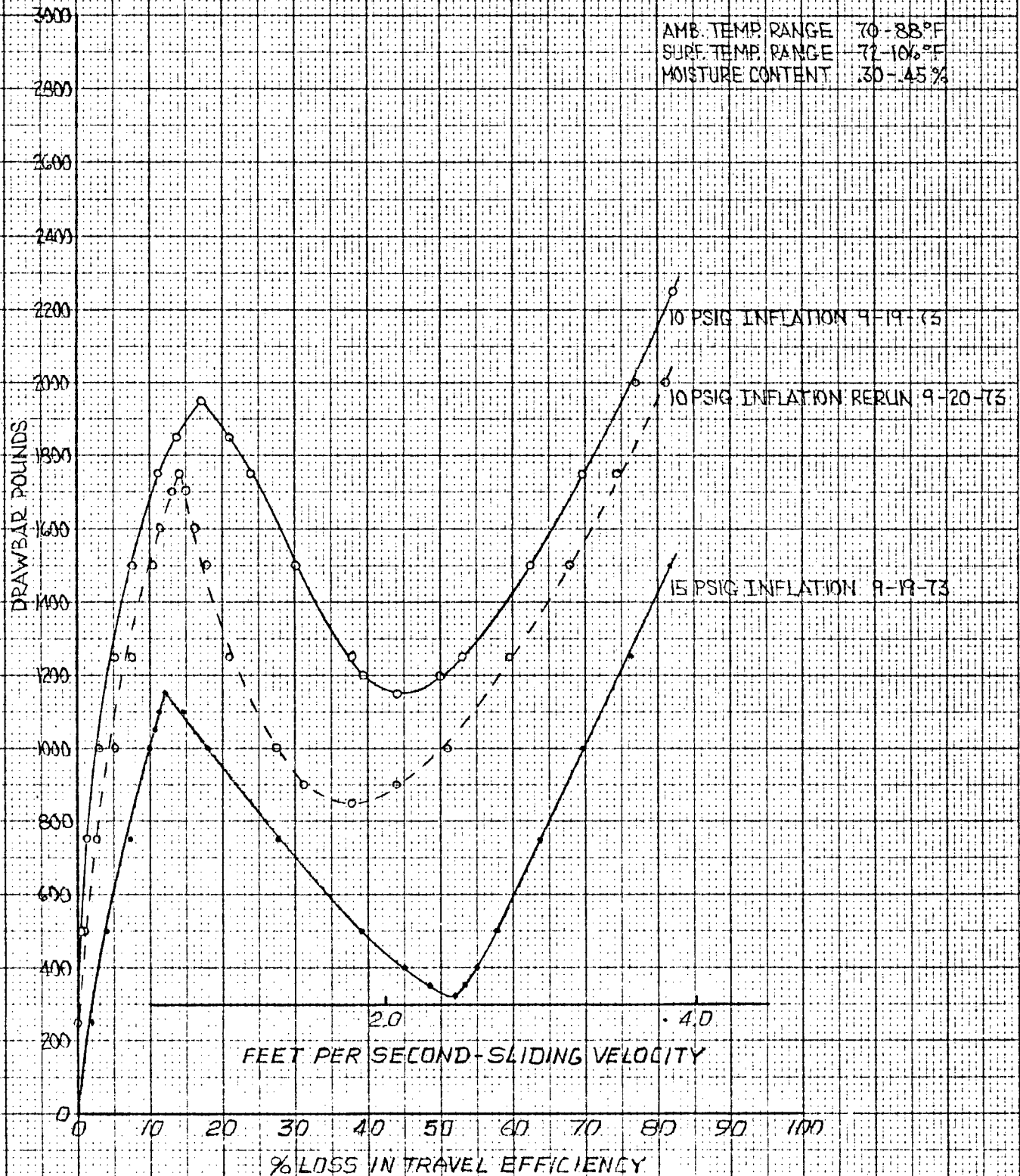
DYNAMIC TRACTION
DRY SAND
GROUP: A RUN NO. 2
6 WHEEL DRIVE
3.2 MPH
FIGURE NO. 3

Location: SAND MOUNTAIN, NEVADA

Date: 9-19/20-75 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 70-88°F
SURF. TEMP. RANGE 72-106°F
MOISTURE CONTENT .30-.45%



TEST DATA

DRY SAND

Date: 9-19-73 Time: 3:00 PM Test Vehicle: M-34 6 WHEEL DRIVE
 Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: A
 Inflation, psig: 15 Ambient Temp. °F.: 88 Surface Temp. °F.: 106
 Relative Humidity %: 38 Wind Speed, mph: 9 Wind Direction: W

		Sample Depth, Inches		
		3	9	18
Sand Moisture Content, % (at course location):	200 Feet:	<u>.45</u>	<u>.45</u>	<u>.45</u>
	400 Feet:	<u>.40</u>	<u>.40</u>	<u>.45</u>

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>3.50</u>	<u>3.38</u>	<u>3.75</u>	<u>4.75</u>	<u>4.50</u>	<u>3.75</u>	<u>3.50</u>	<u>4.75</u>
Tire Track Width, Ins.:		<u>23.00</u>	<u>22.00</u>	<u>23.75</u>	<u>23.50</u>	<u>23.50</u>	<u>23.00</u>	<u>22.00</u>	<u>22.00</u>
Cone Penetrometer Readings in Track	3"	<u>10</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>14</u>	<u>10</u>	<u>10</u>	<u>15</u>
	6"	<u>50</u>	<u>35</u>	<u>50</u>	<u>45</u>	<u>55</u>	<u>40</u>	<u>50</u>	<u>60</u>
	9"	<u>90</u>	<u>75</u>	<u>75</u>	<u>90</u>	<u>90</u>	<u>85</u>	<u>80</u>	<u>90</u>
	12"	<u>165</u>	<u>140</u>	<u>115</u>	<u>110</u>	<u>145</u>	<u>140</u>	<u>95</u>	<u>87</u>
	15"	<u>05</u>	<u>05</u>	<u>280</u>	<u>290</u>	<u>290</u>	<u>255</u>	<u>275</u>	<u>255</u>
	18"	<u>-</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>15</u>	<u>15</u>	<u>10</u>	<u>20</u>	<u>20</u>	<u>5</u>	<u>15</u>	<u>17</u>
	6"	<u>40</u>	<u>30</u>	<u>37</u>	<u>40</u>	<u>32</u>	<u>30</u>	<u>30</u>	<u>40</u>
	9"	<u>55</u>	<u>35</u>	<u>60</u>	<u>60</u>	<u>40</u>	<u>55</u>	<u>40</u>	<u>45</u>
	12"	<u>60</u>	<u>37</u>	<u>77</u>	<u>70</u>	<u>40</u>	<u>40</u>	<u>35</u>	<u>45</u>
	15"	<u>60</u>	<u>70</u>	<u>105</u>	<u>70</u>	<u>40</u>	<u>45</u>	<u>35</u>	<u>45</u>
	18"	<u>135</u>	<u>290</u>	<u>255</u>	<u>95</u>	<u>75</u>	<u>105</u>	<u>75</u>	<u>85</u>
	21"	<u>05</u>	<u>05</u>	<u>05</u>	<u>290</u>	<u>205</u>	<u>290</u>	<u>290</u>	<u>05</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	3"	<u>21</u>	<u>21</u>	<u>22</u>	<u>21</u>	<u>25</u>	<u>22</u>	<u>22</u>	<u>19</u>
	6"	<u>68</u>	<u>53</u>	<u>56</u>	<u>51</u>	<u>55</u>	<u>61</u>	<u>57</u>	<u>57</u>
	9"	<u>87</u>	<u>93</u>	<u>101</u>	<u>96</u>	<u>87</u>	<u>103</u>	<u>100</u>	<u>95</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>22</u>	<u>26</u>	<u>24</u>	<u>23</u>	<u>23</u>	<u>20</u>	<u>24</u>	<u>25</u>
	6"	<u>39</u>	<u>47</u>	<u>43</u>	<u>41</u>	<u>41</u>	<u>44</u>	<u>47</u>	<u>46</u>
	9"	<u>58</u>	<u>59</u>	<u>69</u>	<u>66</u>	<u>60</u>	<u>61</u>	<u>68</u>	<u>64</u>

	Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, %	- Front Up:	<u>0.0</u>	<u>-</u>	<u>-</u>	<u>-</u>
	Front Down:	<u>0.0</u>	<u>1.0</u>	<u>1.5</u>	<u>1.5</u>

Tire Hop Frequency, Hz 2.6

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SANDDate: 9-19-73 Time: 4:10 PM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: AInflation, psig: 10 Ambient Temp. °F.: 88 Surface Temp. °F.: 98Relative Humidity %: 31 Wind Speed, mph: 15 Wind Direction: W

		Sample Depth, Inches
		3 9 18
Sand Moisture Content, % (at course location):	200 Feet:	<u>.45</u> <u>.45</u> <u>.45</u>
	400 Feet:	<u>.40</u> <u>.40</u> <u>.45</u>

		Left Rear				Right Rear			
Run Number:		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>3.75</u>	<u>3.13</u>	<u>3.00</u>	<u>4.00</u>	<u>4.25</u>	<u>3.63</u>	<u>3.00</u>	<u>4.50</u>
Tire Track Width, Ins.:		<u>22.00</u>	<u>20.50</u>	<u>18.00</u>	<u>19.00</u>	<u>19.50</u>	<u>21.50</u>	<u>20.00</u>	<u>19.00</u>
Cone Penetrometer Readings in Track	3"	<u>20</u>	<u>10</u>	<u>20</u>	<u>25</u>	<u>25</u>	<u>20</u>	<u>20</u>	<u>10</u>
	6"	<u>70</u>	<u>55</u>	<u>60</u>	<u>65</u>	<u>60</u>	<u>55</u>	<u>55</u>	<u>70</u>
	9"	<u>90</u>	<u>80</u>	<u>85</u>	<u>90</u>	<u>74</u>	<u>75</u>	<u>75</u>	<u>65</u>
	12"	<u>130</u>	<u>80</u>	<u>115</u>	<u>145</u>	<u>110</u>	<u>110</u>	<u>125</u>	<u>80</u>
	15"	<u>05</u>	<u>205</u>	<u>205</u>	<u>05</u>	<u>270</u>	<u>290</u>	<u>05</u>	<u>290</u>
	18"	<u>-</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>20</u>	<u>25</u>	<u>30</u>	<u>20</u>	<u>25</u>	<u>10</u>	<u>20</u>	<u>15</u>
	6"	<u>40</u>	<u>50</u>	<u>45</u>	<u>37</u>	<u>45</u>	<u>30</u>	<u>45</u>	<u>45</u>
	9"	<u>45</u>	<u>85</u>	<u>55</u>	<u>50</u>	<u>55</u>	<u>37</u>	<u>60</u>	<u>80</u>
	12"	<u>55</u>	<u>110</u>	<u>60</u>	<u>55</u>	<u>80</u>	<u>40</u>	<u>75</u>	<u>120</u>
	15"	<u>85</u>	<u>135</u>	<u>60</u>	<u>80</u>	<u>160</u>	<u>45</u>	<u>105</u>	<u>150</u>
	18"	<u>230</u>	<u>05</u>	<u>130</u>	<u>245</u>	<u>05</u>	<u>145</u>	<u>05</u>	<u>255</u>
	21"	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>285</u>	<u>-</u>	<u>05</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>05</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	3"	<u>25</u>	<u>28</u>	<u>21</u>	<u>21</u>	<u>28</u>	<u>27</u>	<u>21</u>	<u>23</u>
	6"	<u>67</u>	<u>51</u>	<u>59</u>	<u>66</u>	<u>78</u>	<u>65</u>	<u>57</u>	<u>67</u>
	9"	<u>90</u>	<u>92</u>	<u>93</u>	<u>89</u>	<u>111</u>	<u>92</u>	<u>88</u>	<u>91</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>32</u>	<u>25</u>	<u>27</u>	<u>28</u>	<u>32</u>	<u>24</u>	<u>25</u>	<u>23</u>
	6"	<u>63</u>	<u>52</u>	<u>47</u>	<u>49</u>	<u>55</u>	<u>53</u>	<u>51</u>	<u>49</u>
	9"	<u>69</u>	<u>54</u>	<u>64</u>	<u>67</u>	<u>79</u>	<u>85</u>	<u>78</u>	<u>72</u>

	Run Number:	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Test Vehicle Attitude at Stall, % - Front Up:		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:		<u>0.5</u>	<u>-</u>	<u>-</u>	<u>1.0</u>

Tire Hop Frequency, Hz 2.6

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SANDDate: 10-20-73 Time: 10:15 AM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: AInflation, psig: 10 Ambient Temp. °F.: 70 Surface Temp. °F.: 72Relative Humidity %: 44 Wind Speed, mph: 9 Wind Direction: WNW

Sand Moisture Content, % (at course location):	Sample Depth, Inches		
	3	9	18
200 Feet:	<u>.35</u>	<u>.30</u>	<u>.35</u>
400 Feet:	<u>.30</u>	<u>.30</u>	<u>.45</u>

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>6.00</u>	<u>4.75</u>	<u>4.00</u>	<u>6.00</u>	<u>5.63</u>	<u>4.25</u>	<u>4.25</u>	<u>6.50</u>
Tire Track Width, Ins.:		<u>22.50</u>	<u>23.00</u>	<u>21.50</u>	<u>21.00</u>	<u>22.50</u>	<u>23.00</u>	<u>21.00</u>	<u>22.00</u>
Cone Penetrometer Readings in Track	3"	<u>20</u>	<u>15</u>	<u>20</u>	<u>35</u>	<u>15</u>	<u>20</u>	<u>10</u>	<u>30</u>
	6"	<u>55</u>	<u>45</u>	<u>70</u>	<u>80</u>	<u>65</u>	<u>65</u>	<u>45</u>	<u>60</u>
	9"	<u>105</u>	<u>115</u>	<u>115</u>	<u>90</u>	<u>90</u>	<u>85</u>	<u>155</u>	<u>80</u>
	12"	<u>100</u>	<u>105</u>	<u>120</u>	<u>150</u>	<u>90</u>	<u>105</u>	<u>105</u>	<u>85</u>
	15"	<u>275</u>	<u>05</u>	<u>190</u>	<u>05</u>	<u>265</u>	<u>245</u>	<u>265</u>	<u>175</u>
	18"	<u>05</u>	<u>-</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>10</u>	<u>20</u>	<u>5</u>	<u>15</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>20</u>
	6"	<u>25</u>	<u>35</u>	<u>25</u>	<u>40</u>	<u>25</u>	<u>35</u>	<u>60</u>	<u>45</u>
	9"	<u>85</u>	<u>50</u>	<u>85</u>	<u>65</u>	<u>75</u>	<u>60</u>	<u>50</u>	<u>55</u>
	12"	<u>70</u>	<u>50</u>	<u>45</u>	<u>75</u>	<u>40</u>	<u>50</u>	<u>45</u>	<u>65</u>
	15"	<u>75</u>	<u>50</u>	<u>45</u>	<u>95</u>	<u>35</u>	<u>45</u>	<u>50</u>	<u>80</u>
	18"	<u>130</u>	<u>195</u>	<u>230</u>	<u>05</u>	<u>225</u>	<u>185</u>	<u>95</u>	<u>185</u>
	21"	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	3"	<u>27</u>	<u>24</u>	<u>21</u>	<u>31</u>	<u>27</u>	<u>28</u>	<u>24</u>	<u>27</u>
	6"	<u>59</u>	<u>52</u>	<u>52</u>	<u>56</u>	<u>63</u>	<u>72</u>	<u>51</u>	<u>68</u>
	9"	<u>98</u>	<u>94</u>	<u>76</u>	<u>97</u>	<u>95</u>	<u>104</u>	<u>93</u>	<u>101</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>22</u>	<u>25</u>	<u>29</u>	<u>27</u>	<u>22</u>	<u>31</u>	<u>21</u>	<u>19</u>
	6"	<u>41</u>	<u>39</u>	<u>48</u>	<u>45</u>	<u>35</u>	<u>51</u>	<u>40</u>	<u>48</u>
	9"	<u>66</u>	<u>54</u>	<u>64</u>	<u>57</u>	<u>51</u>	<u>55</u>	<u>62</u>	<u>71</u>

Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:	<u>1.5</u>	<u>1.0</u>	<u>-</u>	<u>1.5</u>

Tire Hop Frequency, Hz 2.6

Comments: _____

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY SAND

GROUP B RUN NO. 3

6 WHEEL DRIVE

3.2 MPH

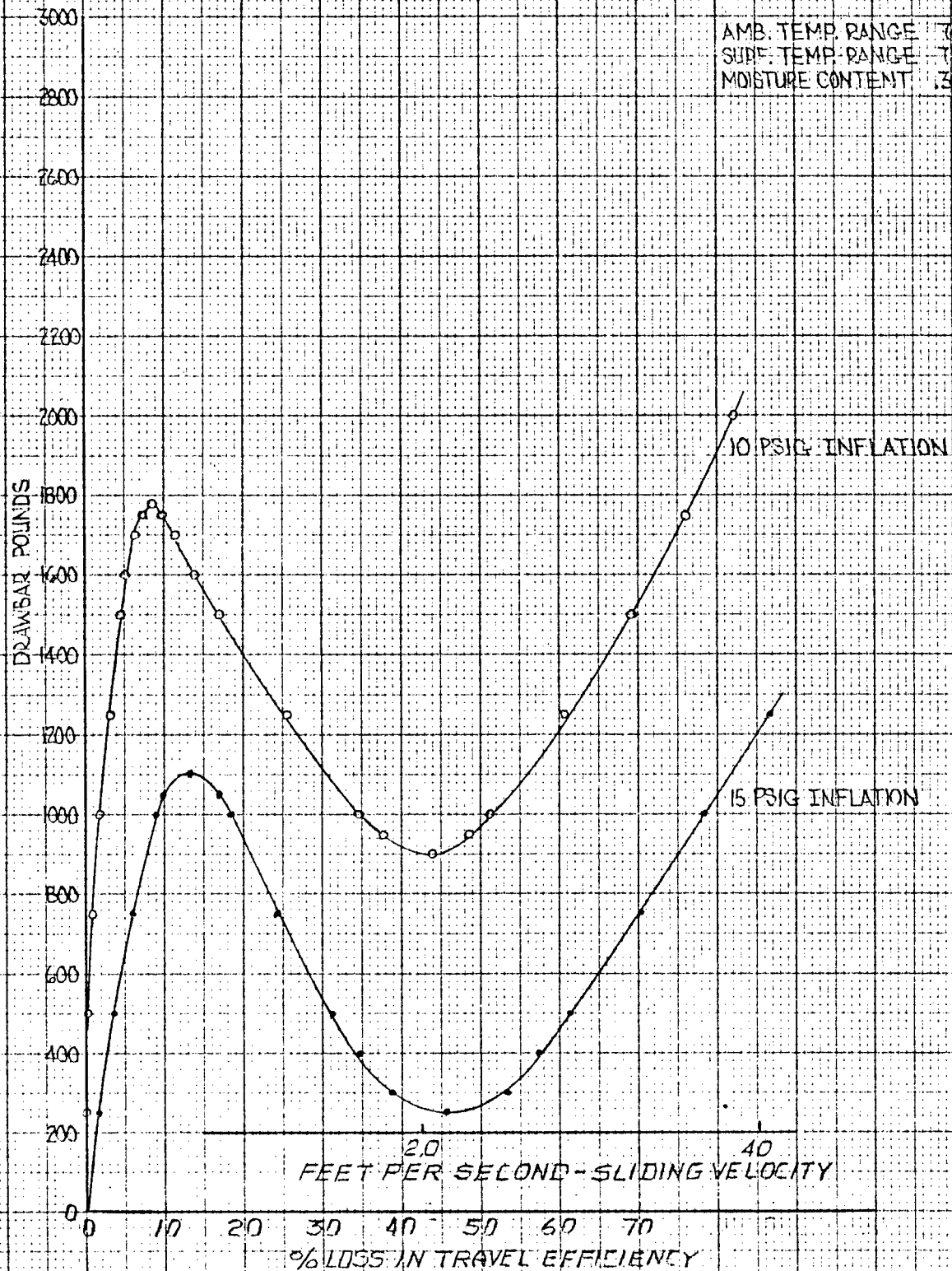
FIGURE NO. 4

Location: SAND MOUNTAIN, NEVADA

Date: 9-20-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 74°F
SURF. TEMP. RANGE 73°F
MOISTURE CONTENT 30-.45%



TEST DATA

DRY SAND

Date: 9-20-73 Time: 10:50 AM Test Vehicle: M-34 6 WHEEL DRIVE
 Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: B
 Inflation, psig: 15 Ambient Temp. °F.: 74 Surface Temp. °F.: 78
 Relative Humidity %: 44 Wind Speed, mph: 7 Wind Direction: W

		Sample Depth, Inches
		3 9 18
Sand Moisture Content, % (at course location):	200 Feet:	<u>.35</u> <u>.30</u> <u>.35</u>
	400 Feet:	<u>.30</u> <u>.30</u> <u>.45</u>

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>4.75</u>	<u>3.75</u>	<u>3.50</u>	<u>3.75</u>	<u>4.50</u>	<u>3.75</u>	<u>3.00</u>	<u>3.00</u>
Tire Track Width, Ins.:		<u>22.50</u>	<u>24.00</u>	<u>24.50</u>	<u>24.00</u>	<u>22.00</u>	<u>24.50</u>	<u>23.00</u>	<u>22.00</u>
Cone Penetrometer Readings in Track	3"	<u>10</u>	<u>15</u>	<u>13</u>	<u>10</u>	<u>10</u>	<u>20</u>	<u>15</u>	<u>5</u>
	6"	<u>45</u>	<u>70</u>	<u>40</u>	<u>40</u>	<u>11</u>	<u>55</u>	<u>65</u>	<u>35</u>
	9"	<u>135</u>	<u>120</u>	<u>75</u>	<u>100</u>	<u>135</u>	<u>105</u>	<u>95</u>	<u>130</u>
	12"	<u>105</u>	<u>165</u>	<u>130</u>	<u>105</u>	<u>130</u>	<u>145</u>	<u>125</u>	<u>130</u>
	15"	<u>05</u>	<u>05</u>	<u>285</u>	<u>135</u>	<u>05</u>	<u>05</u>	<u>275</u>	<u>245</u>
	18"	<u>-</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>-</u>	<u>05</u>	<u>05</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>10</u>	<u>10</u>	<u>13</u>	<u>10</u>	<u>5</u>	<u>10</u>	<u>25</u>	<u>20</u>
	6"	<u>25</u>	<u>20</u>	<u>25</u>	<u>50</u>	<u>20</u>	<u>35</u>	<u>35</u>	<u>40</u>
	9"	<u>65</u>	<u>85</u>	<u>30</u>	<u>65</u>	<u>70</u>	<u>80</u>	<u>35</u>	<u>45</u>
	12"	<u>45</u>	<u>60</u>	<u>40</u>	<u>70</u>	<u>65</u>	<u>55</u>	<u>45</u>	<u>55</u>
	15"	<u>55</u>	<u>65</u>	<u>40</u>	<u>75</u>	<u>80</u>	<u>55</u>	<u>55</u>	<u>55</u>
	18"	<u>290</u>	<u>105</u>	<u>105</u>	<u>165</u>	<u>240</u>	<u>190</u>	<u>290</u>	<u>290</u>
	21"	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	3"	<u>21</u>	<u>24</u>	<u>18</u>	<u>18</u>	<u>23</u>	<u>24</u>	<u>15</u>	<u>19</u>
	6"	<u>50</u>	<u>50</u>	<u>48</u>	<u>48</u>	<u>59</u>	<u>54</u>	<u>59</u>	<u>42</u>
	9"	<u>100</u>	<u>100</u>	<u>110</u>	<u>106</u>	<u>100</u>	<u>95</u>	<u>100</u>	<u>97</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>26</u>	<u>16</u>	<u>24</u>	<u>22</u>	<u>22</u>	<u>20</u>	<u>18</u>	<u>25</u>
	6"	<u>46</u>	<u>38</u>	<u>50</u>	<u>50</u>	<u>41</u>	<u>46</u>	<u>58</u>	<u>55</u>
	9"	<u>54</u>	<u>56</u>	<u>76</u>	<u>70</u>	<u>54</u>	<u>62</u>	<u>76</u>	<u>70</u>

	Run Number:	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Test Vehicle Attitude at Stall, % - Front Up:		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:		<u>0.5</u>	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>

Tire Hop Frequency, Hz 3.0

Comments: _____

TEST DATA

DRY SAND

Date: 9-20-73 Time: 11:15 AM Test Vehicle: M-34 4 WHEEL DRIVE
 Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: B
 Inflation, psig: 10 Ambient Temp. °F.: 74 Surface Temp. °F.: 78
 Relative Humidity %: 44 Wind Speed, mph: 7 Wind Direction: W

		Sample Depth, Inches		
		<u>3</u>	<u>9</u>	<u>18</u>
Sand Moisture Content, % (at course location):	200 Feet:	<u>.35</u>	<u>.30</u>	<u>.35</u>
	400 Feet:	<u>.30</u>	<u>.30</u>	<u>.45</u>

Run Number:		Left Rear				Right Rear			
		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Tire Track Depth, Ins.:		<u>3.75</u>	<u>3.75</u>	<u>4.00</u>	<u>3.50</u>	<u>4.25</u>	<u>3.75</u>	<u>3.75</u>	<u>3.50</u>
Tire Track Width, Ins.:		<u>20.00</u>	<u>18.00</u>	<u>20.00</u>	<u>19.50</u>	<u>20.00</u>	<u>19.00</u>	<u>20.00</u>	<u>18.50</u>
Cone Penetrometer Readings in Track	3"	<u>15</u>	<u>10</u>	<u>20</u>	<u>15</u>	<u>20</u>	<u>15</u>	<u>25</u>	<u>20</u>
	6"	<u>85</u>	<u>55</u>	<u>75</u>	<u>65</u>	<u>65</u>	<u>70</u>	<u>70</u>	<u>65</u>
	9"	<u>80</u>	<u>80</u>	<u>105</u>	<u>85</u>	<u>70</u>	<u>85</u>	<u>110</u>	<u>95</u>
	12"	<u>80</u>	<u>95</u>	<u>115</u>	<u>90</u>	<u>90</u>	<u>105</u>	<u>105</u>	<u>125</u>
	15"	<u>215</u>	<u>195</u>	<u>175</u>	<u>155</u>	<u>215</u>	<u>195</u>	<u>175</u>	<u>240</u>
	18"	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>15</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>12</u>	<u>25</u>	<u>20</u>
	6"	<u>50</u>	<u>55</u>	<u>35</u>	<u>45</u>	<u>30</u>	<u>45</u>	<u>70</u>	<u>35</u>
	9"	<u>75</u>	<u>55</u>	<u>70</u>	<u>65</u>	<u>55</u>	<u>55</u>	<u>80</u>	<u>50</u>
	12"	<u>90</u>	<u>65</u>	<u>95</u>	<u>75</u>	<u>50</u>	<u>55</u>	<u>85</u>	<u>80</u>
	15"	<u>115</u>	<u>90</u>	<u>115</u>	<u>85</u>	<u>35</u>	<u>60</u>	<u>140</u>	<u>85</u>
	18"	<u>135</u>	<u>05</u>	<u>05</u>	<u>275</u>	<u>75</u>	<u>265</u>	<u>255</u>	<u>95</u>
	21"	<u>05</u>	<u>-</u>	<u>-</u>	<u>05</u>	<u>135</u>	<u>05</u>	<u>05</u>	<u>140</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>05</u>	<u>-</u>	<u>-</u>	<u>245</u>
Plate Penetrometer Readings in Track, psi	3"	<u>21</u>	<u>21</u>	<u>20</u>	<u>21</u>	<u>23</u>	<u>28</u>	<u>23</u>	<u>28</u>
	6"	<u>50</u>	<u>53</u>	<u>55</u>	<u>52</u>	<u>61</u>	<u>64</u>	<u>49</u>	<u>74</u>
	9"	<u>84</u>	<u>83</u>	<u>98</u>	<u>70</u>	<u>102</u>	<u>85</u>	<u>90</u>	<u>96</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>23</u>	<u>25</u>	<u>10</u>	<u>24</u>	<u>23</u>	<u>26</u>	<u>32</u>	<u>27</u>
	6"	<u>39</u>	<u>45</u>	<u>44</u>	<u>55</u>	<u>52</u>	<u>54</u>	<u>61</u>	<u>55</u>
	9"	<u>71</u>	<u>58</u>	<u>79</u>	<u>81</u>	<u>55</u>	<u>65</u>	<u>74</u>	<u>78</u>

	Run Number:	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Test Vehicle Attitude at Stall, %	- Front Up:	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	Front Down:	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.5</u>

Tire Hop Frequency, Hz 2.5

Comments: _____

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY SAND

GROUP: C RUN NO. 4

6 WHEEL DRIVE

3.2 MPH

FIGURE NO. 5

Location: SAND MOUNTAIN, NEVADA

Date: 9-20-73

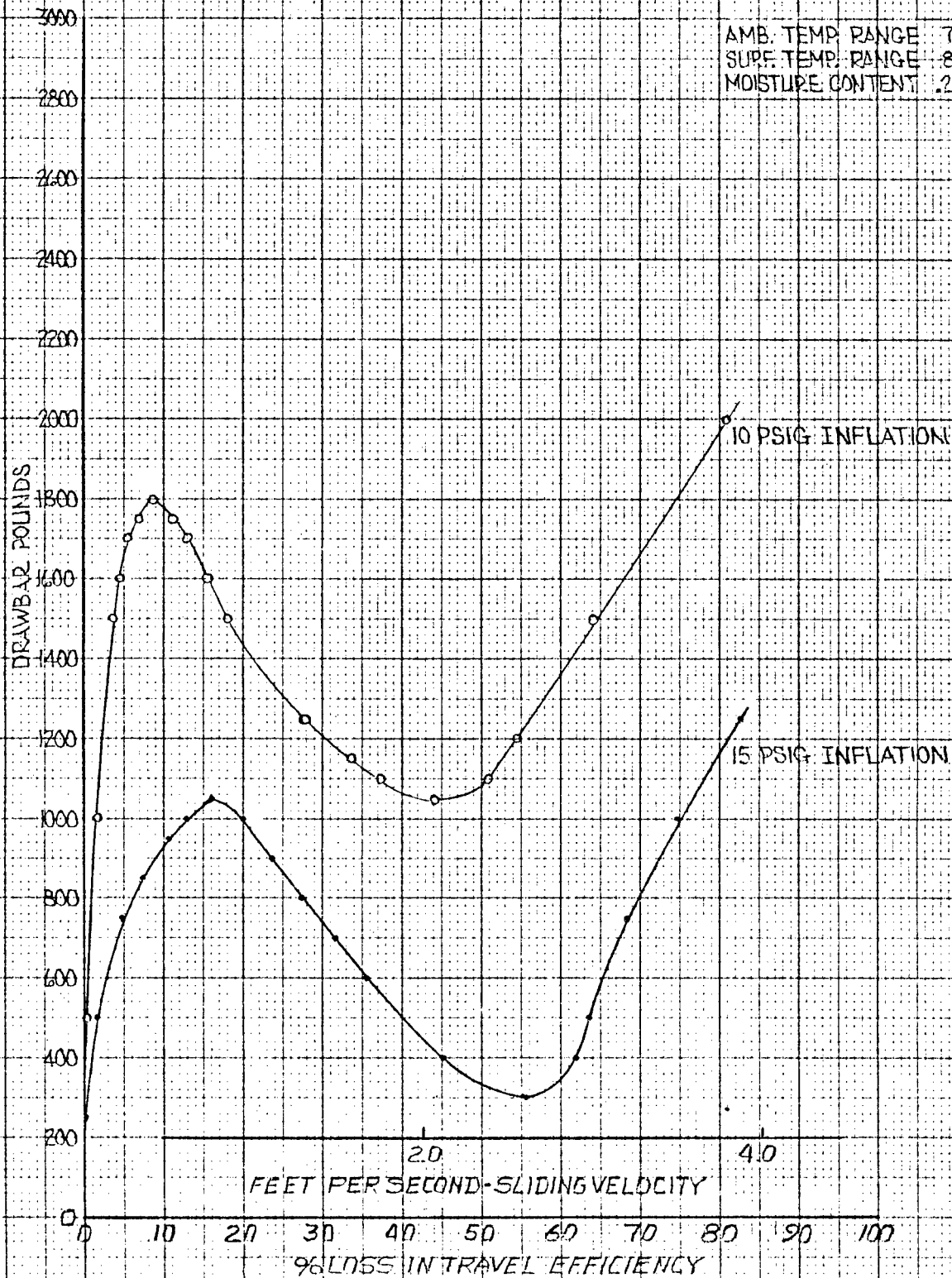
Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 77-80°F

SURF. TEMP. RANGE 88-94°F

MOISTURE CONTENT .25-.50%



TEST DATA

DRY SAND

Date: 9-20-73 Time: 1:15 PM Test Vehicle: M-34 6 WHEEL DRIVE
 Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: C
 Inflation, psig: 15 Ambient Temp. °F.: 77 Surface Temp. °F.: 88
 Relative Humidity %: 52 Wind Speed, mph: 7 Wind Direction: WNW

Sand Moisture Content, % (at course location): 200 Feet: .25 .40 .45
 400 Feet: .35 .40 .50

		Left Rear				Right Rear			
Run Number:		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>4.25</u>	<u>4.00</u>	<u>3.50</u>	<u>4.25</u>	<u>4.50</u>	<u>4.00</u>	<u>4.00</u>	<u>4.25</u>
Tire Track Width, Ins.:		<u>23.00</u>	<u>23.00</u>	<u>22.00</u>	<u>23.00</u>	<u>23.50</u>	<u>24.00</u>	<u>22.50</u>	<u>23.50</u>
Cone Penetrometer Readings in Track	3"	<u>15</u>	<u>25</u>	<u>25</u>	<u>10</u>	<u>25</u>	<u>25</u>	<u>20</u>	<u>15</u>
	6"	<u>55</u>	<u>85</u>	<u>75</u>	<u>40</u>	<u>75</u>	<u>55</u>	<u>65</u>	<u>45</u>
	9"	<u>130</u>	<u>105</u>	<u>105</u>	<u>150</u>	<u>105</u>	<u>110</u>	<u>110</u>	<u>125</u>
	12"	<u>135</u>	<u>190</u>	<u>175</u>	<u>140</u>	<u>155</u>	<u>175</u>	<u>145</u>	<u>105</u>
	15"	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>10</u>	<u>10</u>	<u>20</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>20</u>
	6"	<u>40</u>	<u>50</u>	<u>40</u>	<u>55</u>	<u>45</u>	<u>25</u>	<u>45</u>	<u>55</u>
	9"	<u>60</u>	<u>45</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>60</u>	<u>50</u>
	12"	<u>65</u>	<u>45</u>	<u>45</u>	<u>45</u>	<u>50</u>	<u>50</u>	<u>60</u>	<u>50</u>
	15"	<u>135</u>	<u>65</u>	<u>65</u>	<u>45</u>	<u>55</u>	<u>145</u>	<u>70</u>	<u>120</u>
	18"	<u>05</u>	<u>265</u>	<u>05</u>	<u>235</u>	<u>240</u>	<u>05</u>	<u>225</u>	<u>05</u>
	21"	<u>-</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	3"	<u>22</u>	<u>20</u>	<u>22</u>	<u>21</u>	<u>22</u>	<u>21</u>	<u>25</u>	<u>20</u>
	6"	<u>56</u>	<u>46</u>	<u>52</u>	<u>51</u>	<u>54</u>	<u>51</u>	<u>55</u>	<u>53</u>
	9"	<u>106</u>	<u>82</u>	<u>102</u>	<u>92</u>	<u>103</u>	<u>96</u>	<u>94</u>	<u>110</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>22</u>	<u>22</u>	<u>22</u>	<u>23</u>	<u>21</u>	<u>32</u>	<u>26</u>	<u>27</u>
	6"	<u>46</u>	<u>41</u>	<u>39</u>	<u>37</u>	<u>42</u>	<u>36</u>	<u>46</u>	<u>49</u>
	9"	<u>61</u>	<u>54</u>	<u>54</u>	<u>55</u>	<u>62</u>	<u>38</u>	<u>61</u>	<u>64</u>

Run Number: 1 2 3 4
 Test Vehicle Attitude at Stall, % - Front Up: - - - -
 Front Down: 0.5 1.0 1.0 1.5

Tire Hop Frequency, Hz 2.9

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SANDDate: 9-20-73 Time: 1:45 PM Test Vehicle: M-34 4 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: CInflation, psig: 40 Ambient Temp. °F.: 80 Surface Temp. °F.: 94Relative Humidity %: 48 Wind Speed, mph: 15 Wind Direction: W

	Sample Depth, Inches		
	3	9	18
Sand Moisture Content, % (at course location): 200 Feet:	<u>.25</u>	<u>.40</u>	<u>.45</u>
400 Feet:	<u>.35</u>	<u>.40</u>	<u>.50</u>

Run Number:	Left Rear				Right Rear			
	1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:	<u>4.25</u>	<u>3.75</u>	<u>4.50</u>	<u>3.00</u>	<u>4.25</u>	<u>3.75</u>	<u>4.25</u>	<u>4.50</u>
Tire Track Width, Ins.:	<u>20.50</u>	<u>22.00</u>	<u>18.50</u>	<u>16.50</u>	<u>20.50</u>	<u>20.00</u>	<u>18.50</u>	<u>17.50</u>
Cone Penetrometer Readings in Track								
3"	<u>20</u>	<u>10</u>	<u>20</u>	<u>20</u>	<u>5</u>	<u>20</u>	<u>20</u>	<u>10</u>
6"	<u>50</u>	<u>65</u>	<u>95</u>	<u>80</u>	<u>25</u>	<u>55</u>	<u>50</u>	<u>75</u>
9"	<u>85</u>	<u>80</u>	<u>75</u>	<u>110</u>	<u>125</u>	<u>90</u>	<u>100</u>	<u>80</u>
12"	<u>110</u>	<u>135</u>	<u>100</u>	<u>110</u>	<u>125</u>	<u>100</u>	<u>140</u>	<u>95</u>
15"	<u>205</u>	<u>05</u>	<u>280</u>	<u>145</u>	<u>220</u>	<u>215</u>	<u>180</u>	<u>160</u>
18"	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand								
3"	<u>10</u>	<u>5</u>	<u>20</u>	<u>15</u>	<u>15</u>	<u>10</u>	<u>10</u>	<u>10</u>
6"	<u>40</u>	<u>55</u>	<u>50</u>	<u>45</u>	<u>30</u>	<u>40</u>	<u>50</u>	<u>60</u>
9"	<u>70</u>	<u>60</u>	<u>70</u>	<u>60</u>	<u>40</u>	<u>45</u>	<u>60</u>	<u>65</u>
12"	<u>75</u>	<u>75</u>	<u>90</u>	<u>60</u>	<u>35</u>	<u>45</u>	<u>80</u>	<u>80</u>
15"	<u>110</u>	<u>105</u>	<u>120</u>	<u>55</u>	<u>35</u>	<u>40</u>	<u>95</u>	<u>100</u>
18"	<u>290</u>	<u>05</u>	<u>290</u>	<u>155</u>	<u>190</u>	<u>30</u>	<u>170</u>	<u>210</u>
21"	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>205</u>	<u>290</u>	<u>05</u>
24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi								
3"	<u>24</u>	<u>18</u>	<u>26</u>	<u>24</u>	<u>23</u>	<u>25</u>	<u>16</u>	<u>22</u>
6"	<u>49</u>	<u>42</u>	<u>52</u>	<u>55</u>	<u>40</u>	<u>44</u>	<u>49</u>	<u>66</u>
9"	<u>83</u>	<u>72</u>	<u>86</u>	<u>96</u>	<u>98</u>	<u>104</u>	<u>92</u>	<u>102</u>
Cone Penetrometer Readings in Virgin Sand, psi								
3"	<u>15</u>	<u>26</u>	<u>23</u>	<u>24</u>	<u>21</u>	<u>20</u>	<u>26</u>	<u>25</u>
6"	<u>41</u>	<u>52</u>	<u>44</u>	<u>50</u>	<u>40</u>	<u>46</u>	<u>52</u>	<u>57</u>
9"	<u>68</u>	<u>68</u>	<u>86</u>	<u>55</u>	<u>45</u>	<u>59</u>	<u>68</u>	<u>77</u>

	Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:		<u>0.5</u>	<u>1.0</u>	<u>1.5</u>	<u>1.0</u>

Tire Hop Frequency, Hz 2.5

Comments: _____

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY SAND

GROUP: E RUN NO: 5

6 WHEEL DRIVE

5.2 MPH

FIGURE NO. 6

Location: SAND MOUNTAIN, NEVADA

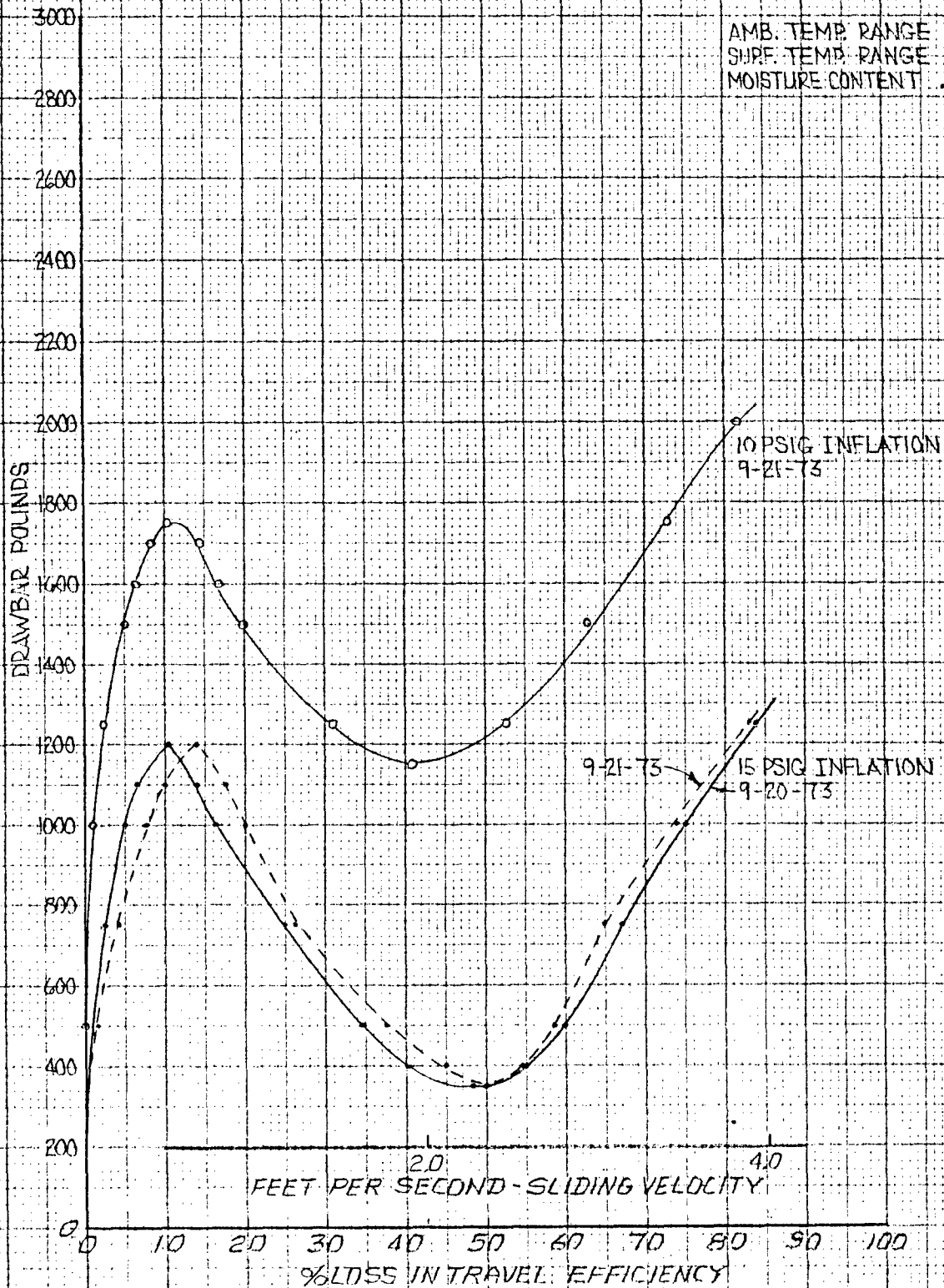
Date: 9-20/21-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 55 - 80°F

SURF. TEMP. RANGE 54 - 94°F

MOISTURE CONTENT .25 - .50%



TEST DATA

DRY SANDDate: 9-20-73 Time: 2:40 PM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: EInflation, psig: 15 Ambient Temp. °F.: 80 Surface Temp. °F.: 94Relative Humidity %: 48 Wind Speed, mph: 15 Wind Direction: W

	Sample Depth, Inches		
	3	9	18
Sand Moisture Content, % (at course location): 200 Feet:	<u>.25</u>	<u>.40</u>	<u>.45</u>
400 Feet:	<u>.35</u>	<u>.40</u>	<u>.50</u>

Run Number:	Left Rear				Right Rear			
	1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:	<u>3.75</u>	<u>3.50</u>	<u>4.25</u>	<u>3.50</u>	<u>4.25</u>	<u>4.25</u>	<u>4.25</u>	<u>4.25</u>
Tire Track Width, Ins.:	<u>21.50</u>	<u>21.50</u>	<u>22.50</u>	<u>21.50</u>	<u>23.00</u>	<u>22.50</u>	<u>21.50</u>	<u>22.50</u>
Cone Penetrometer Readings in Track								
3"	<u>10</u>	<u>10</u>	<u>25</u>	<u>10</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>20</u>
6"	<u>30</u>	<u>70</u>	<u>75</u>	<u>50</u>	<u>40</u>	<u>50</u>	<u>70</u>	<u>75</u>
9"	<u>100</u>	<u>90</u>	<u>110</u>	<u>95</u>	<u>150</u>	<u>90</u>	<u>100</u>	<u>110</u>
12"	<u>135</u>	<u>135</u>	<u>140</u>	<u>145</u>	<u>125</u>	<u>160</u>	<u>135</u>	<u>125</u>
15"	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>290</u>	<u>05</u>	<u>285</u>	<u>05</u>
18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>-</u>
21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand								
3"	<u>5</u>	<u>15</u>	<u>20</u>	<u>15</u>	<u>15</u>	<u>20</u>	<u>20</u>	<u>15</u>
6"	<u>50</u>	<u>40</u>	<u>50</u>	<u>50</u>	<u>40</u>	<u>50</u>	<u>50</u>	<u>40</u>
9"	<u>55</u>	<u>55</u>	<u>60</u>	<u>70</u>	<u>60</u>	<u>60</u>	<u>70</u>	<u>55</u>
12"	<u>50</u>	<u>50</u>	<u>55</u>	<u>70</u>	<u>65</u>	<u>65</u>	<u>80</u>	<u>55</u>
15"	<u>50</u>	<u>45</u>	<u>55</u>	<u>80</u>	<u>105</u>	<u>110</u>	<u>135</u>	<u>80</u>
18"	<u>280</u>	<u>285</u>	<u>285</u>	<u>05</u>	<u>265</u>	<u>05</u>	<u>280</u>	<u>285</u>
21"	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>
24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi								
3"	<u>21</u>	<u>22</u>	<u>25</u>	<u>24</u>	<u>21</u>	<u>20</u>	<u>25</u>	<u>25</u>
6"	<u>48</u>	<u>52</u>	<u>53</u>	<u>55</u>	<u>51</u>	<u>51</u>	<u>61</u>	<u>52</u>
9"	<u>98</u>	<u>102</u>	<u>101</u>	<u>99</u>	<u>105</u>	<u>101</u>	<u>101</u>	<u>110</u>
Cone Penetrometer Readings in Virgin Sand, psi								
3"	<u>25</u>	<u>24</u>	<u>28</u>	<u>25</u>	<u>19</u>	<u>26</u>	<u>18</u>	<u>26</u>
6"	<u>48</u>	<u>48</u>	<u>49</u>	<u>50</u>	<u>32</u>	<u>48</u>	<u>55</u>	<u>43</u>
9"	<u>66</u>	<u>60</u>	<u>65</u>	<u>66</u>	<u>57</u>	<u>70</u>	<u>80</u>	<u>66</u>

Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:	<u>1.5</u>	<u>1.0</u>	<u>1.5</u>	<u>1.0</u>

Tire Hop Frequency, Hz 2.8

Comments: _____

TEST DATA

DRY SAND

Date: 9-21-73 Time: 9:15 AM Test Vehicle: M-34 6 WHEEL DRIVE
 Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: E
 Inflation, psig: 15 Ambient Temp. °F.: 55 Surface Temp. °F.: 54
 Relative Humidity %: 51 Wind Speed, mph: 1 Wind Direction: SW

		Sample Depth, Inches		
		3	9	18
Sand Moisture Content, % (at course location):	200 Feet:	<u>.25</u>	<u>.35</u>	<u>.35</u>
	400 Feet:	<u>.50</u>	<u>.35</u>	<u>.35</u>

Run Number:	Left Rear				Right Rear			
	1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:	<u>4.50</u>	<u>5.50</u>	<u>4.75</u>	<u>4.75</u>	<u>4.75</u>	<u>5.00</u>	<u>4.50</u>	<u>4.38</u>
Tire Track Width, Ins.:	<u>22.50</u>	<u>23.00</u>	<u>22.50</u>	<u>24.00</u>	<u>23.00</u>	<u>24.00</u>	<u>22.50</u>	<u>22.00</u>
Cone Penetrometer	3"	<u>20</u>	<u>15</u>	<u>10</u>	<u>10</u>	<u>25</u>	<u>20</u>	<u>15</u>
Readings in Track	6"	<u>65</u>	<u>60</u>	<u>90</u>	<u>55</u>	<u>75</u>	<u>85</u>	<u>95</u>
	9"	<u>100</u>	<u>110</u>	<u>95</u>	<u>100</u>	<u>95</u>	<u>105</u>	<u>105</u>
	12"	<u>105</u>	<u>145</u>	<u>105</u>	<u>115</u>	<u>105</u>	<u>135</u>	<u>125</u>
	15"	<u>245</u>	<u>05</u>	<u>05</u>	<u>290</u>	<u>265</u>	<u>290</u>	<u>05</u>
	18"	<u>05</u>	-	-	<u>05</u>	<u>05</u>	-	<u>05</u>
	21"	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-
Cone Penetrometer	3"	<u>20</u>	<u>15</u>	<u>20</u>	<u>15</u>	<u>10</u>	<u>20</u>	<u>10</u>
Readings in	6"	<u>45</u>	<u>35</u>	<u>45</u>	<u>35</u>	<u>50</u>	<u>40</u>	<u>55</u>
Virgin Sand	9"	<u>60</u>	<u>50</u>	<u>65</u>	<u>55</u>	<u>50</u>	<u>55</u>	<u>55</u>
	12"	<u>65</u>	<u>55</u>	<u>70</u>	<u>70</u>	<u>65</u>	<u>60</u>	<u>70</u>
	15"	<u>65</u>	<u>65</u>	<u>75</u>	<u>75</u>	<u>70</u>	<u>60</u>	<u>85</u>
	18"	<u>165</u>	<u>165</u>	<u>290</u>	<u>180</u>	<u>115</u>	<u>115</u>	<u>225</u>
	21"	<u>05</u>	<u>05</u>	<u>05</u>	<u>295</u>	<u>270</u>	<u>240</u>	<u>05</u>
	24"	-	-	-	<u>05</u>	<u>05</u>	-	-
Plate Penetrometer	3"	<u>25</u>	<u>24</u>	<u>21</u>	<u>24</u>	<u>27</u>	<u>25</u>	<u>26</u>
Readings in Track,	6"	<u>51</u>	<u>51</u>	<u>60</u>	<u>66</u>	<u>52</u>	<u>61</u>	<u>61</u>
psi	9"	<u>88</u>	<u>91</u>	<u>104</u>	<u>95</u>	<u>104</u>	<u>101</u>	<u>90</u>
Cone Penetrometer	3"	<u>22</u>	<u>20</u>	<u>24</u>	<u>24</u>	<u>22</u>	<u>21</u>	<u>24</u>
Readings in	6"	<u>51</u>	<u>41</u>	<u>38</u>	<u>45</u>	<u>43</u>	<u>41</u>	<u>44</u>
Virgin Sand, psi	9"	-	-	-	-	-	-	-

	Run Number:	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Test Vehicle Attitude at Stall, % - Front Up:		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:		<u>1.5</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>

Tire Hop Frequency, Hz 3.0

Comments: _____

TEST DATA

DRY SANDDate: 9-21-73 Time: 9:50 AM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: EInflation, psig: 10 Ambient Temp. °F.: 68 Surface Temp. °F.: 68Relative Humidity %: 59 Wind Speed, mph: 6 Wind Direction: E

	Sample Depth, Inches		
	3	9	18
Sand Moisture Content, % (at course location): 200 Feet:	<u>.25</u>	<u>.35</u>	<u>.35</u>
400 Feet:	<u>.50</u>	<u>.35</u>	<u>.35</u>

Run Number:	Left Rear				Right Rear			
	1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:	<u>4.75</u>	<u>4.50</u>	<u>4.50</u>	<u>5.50</u>	<u>4.25</u>	<u>5.00</u>	<u>4.50</u>	<u>5.50</u>
Tire Track Width, Ins.:	<u>21.50</u>	<u>19.50</u>	<u>19.00</u>	<u>22.00</u>	<u>20.00</u>	<u>19.50</u>	<u>18.50</u>	<u>22.50</u>
Cone Penetrometer Readings in Track								
3"	<u>10</u>	<u>15</u>	<u>10</u>	<u>25</u>	<u>30</u>	<u>10</u>	<u>20</u>	<u>25</u>
6"	<u>40</u>	<u>55</u>	<u>80</u>	<u>70</u>	<u>80</u>	<u>95</u>	<u>80</u>	<u>65</u>
9"	<u>130</u>	<u>65</u>	<u>80</u>	<u>80</u>	<u>85</u>	<u>70</u>	<u>85</u>	<u>80</u>
12"	<u>100</u>	<u>105</u>	<u>95</u>	<u>90</u>	<u>90</u>	<u>80</u>	<u>95</u>	<u>150</u>
15"	<u>160</u>	<u>290</u>	<u>240</u>	<u>05</u>	<u>265</u>	<u>290</u>	<u>275</u>	<u>05</u>
18"	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>
21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand								
3"	<u>30</u>	<u>20</u>	<u>15</u>	<u>20</u>	<u>20</u>	<u>15</u>	<u>25</u>	<u>10</u>
6"	<u>55</u>	<u>40</u>	<u>45</u>	<u>35</u>	<u>50</u>	<u>50</u>	<u>50</u>	<u>30</u>
9"	<u>55</u>	<u>45</u>	<u>65</u>	<u>35</u>	<u>70</u>	<u>100</u>	<u>75</u>	<u>50</u>
12"	<u>60</u>	<u>40</u>	<u>70</u>	<u>45</u>	<u>90</u>	<u>105</u>	<u>95</u>	<u>50</u>
15"	<u>95</u>	<u>85</u>	<u>85</u>	<u>195</u>	<u>110</u>	<u>150</u>	<u>165</u>	<u>60</u>
18"	<u>235</u>	<u>270</u>	<u>165</u>	<u>05</u>	<u>280</u>	<u>05</u>	<u>05</u>	<u>200</u>
21"	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>-</u>	<u>-</u>	<u>05</u>
24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi								
3"	<u>26</u>	<u>21</u>	<u>24</u>	<u>32</u>	<u>28</u>	<u>28</u>	<u>25</u>	<u>27</u>
6"	<u>59</u>	<u>60</u>	<u>64</u>	<u>54</u>	<u>56</u>	<u>63</u>	<u>68</u>	<u>71</u>
9"	<u>88</u>	<u>90</u>	<u>94</u>	<u>101</u>	<u>98</u>	<u>88</u>	<u>88</u>	<u>91</u>
Cone Penetrometer Readings in Virgin Sand, psi								
3"	<u>28</u>	<u>28</u>	<u>24</u>	<u>22</u>	<u>27</u>	<u>28</u>	<u>30</u>	<u>21</u>
6"	<u>56</u>	<u>42</u>	<u>46</u>	<u>46</u>	<u>56</u>	<u>53</u>	<u>62</u>	<u>38</u>
9"	<u>65</u>	<u>55</u>	<u>68</u>	<u>64</u>	<u>71</u>	<u>84</u>	<u>78</u>	<u>49</u>

	Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:		<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>

Tire Hop Frequency, Hz 2.8

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY SAND

GROUP: F RUN NO. 6

6 WHEEL DRIVE

3.2 MPH

FIGURE NO. 7

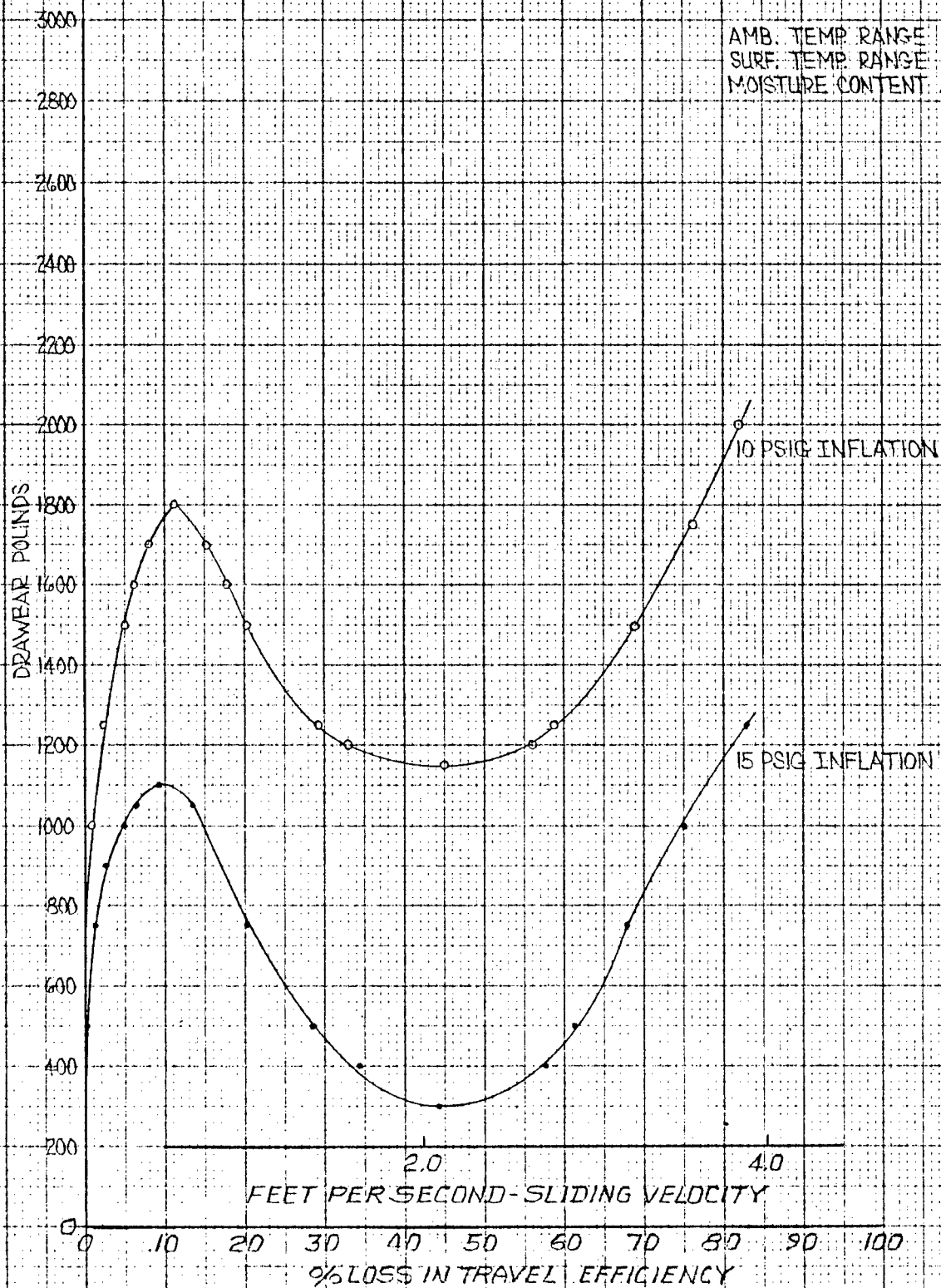
Location: SAND MOUNTAIN, NEVADA

Date: 9-21-73

Test By: WHS

Data By: WHS

AMB. TEMP RANGE 68-71°F
SURF. TEMP RANGE 68-72°F
MOISTURE CONTENT .25-.50%



TEST DATA

DRY SANDDate: 9-21-73 Time: 10:50 AM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: FInflation, psig: 15 Ambient Temp. °F.: 68 Surface Temp. °F.: 68Relative Humidity %: 59 Wind Speed, mph: 6 Wind Direction: E

Sand Moisture Content, % (at course location):	Sample Depth, Inches		
	3	9	18
200 Feet:	.25	.35	.35
400 Feet:	.50	.35	.35

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		4.75	4.75	5.00	5.00	5.13	5.00	6.00	5.50
Tire Track Width, Ins.:		22.00	22.00	21.50	22.00	23.00	22.00	24.50	22.50
Cone Penetrometer Readings in Track	3"	10	10	20	20	10	20	15	15
	6"	70	75	70	60	50	65	45	75
	9"	95	105	130	110	90	115	130	110
	12"	150	145	200	140	125	165	135	140
	15"	290	05	05	05	265	05	05	05
	18"	05	-	-	-	05	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Cone Penetrometer Readings in Virgin Sand	3"	10	10	20	20	15	10	15	10
	6"	30	40	30	30	40	40	40	40
	9"	35	50	35	35	45	55	70	45
	12"	35	50	35	30	45	60	55	40
	15"	30	70	30	35	125	90	195	50
	18"	160	245	290	230	05	275	05	05
	21"	05	05	05	05	-	05	-	-
	24"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Track, psi	3"	25	22	25	27	26	21	25	22
	6"	58	62	56	57	62	54	57	61
	9"	103	101	104	101	101	108	92	101
Cone Penetrometer Readings in Virgin Sand, psi	3"	21	22	24	22	35	22	30	22
	6"	38	32	36	34	46	38	41	36
	9"	47	48	42	39	58	43	57	42

	Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:		-	-	-	-
Front Down:		1.5	1.5	1.0	1.5

Tire Hop Frequency, Hz 3.2

Comments: _____

TEST DATA

DRY SANDDate: 9-21-73 Time: 11:20 AM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: FInflation, psig: 10 Ambient Temp. °F.: 71 Surface Temp. °F.: 72Relative Humidity %: 40 Wind Speed, mph: 1 Wind Direction: E

	Sample Depth, Inches		
	3	9	18
Sand Moisture Content, % (at course location): 200 Feet:	.25	.35	.35
400 Feet:	.50	.35	.35

		Left Rear				Right Rear			
Run Number:		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		4.50	4.50	4.75	4.50	4.50	4.50	4.75	3.75
Tire Track Width, Ins.:		17.00	18.75	18.00	18.50	17.50	17.00	18.00	16.00
Cone Penetrometer Readings in Track	3"	10	20	15	15	20	25	15	10
	6"	70	55	60	75	90	80	55	75
	9"	85	70	70	85	95	95	125	85
	12"	90	90	110	95	135	95	90	90
	15"	195	280	265	230	225	95	165	215
	18"	05	05	05	05	05	05	05	05
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Cone Penetrometer Readings in Virgin Sand	3"	15	10	20	10	20	15	15	15
	6"	50	35	45	45	70	45	60	50
	9"	75	75	65	65	95	45	55	80
	12"	95	90	75	75	100	40	55	90
	15"	145	115	90	100	100	70	70	110
	18"	05	05	275	05	90	235	195	200
	21"	-	-	05	-	135	05	05	290
	24"	-	-	-	-	05	-	-	05
Plate Penetrometer Readings in Track, psi	3"	26	27	26	25	26	31	31	27
	6"	62	63	62	59	71	66	78	65
	9"	101	87	100	92	85	84	88	97
Cone Penetrometer Readings in Virgin Sand, psi	3"	26	24	28	32	36	39	27	32
	6"	49	44	54	55	88	55	54	57
	9"	74	72	79	82	88	72	72	79

	Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:		-	-	-	-
Front Down:		2.0	1.5	2.0	1.5

Tire Hop Frequency, Hz 2.2

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY SAND

GROUP: G RUN NO. 7

4 WHEEL DRIVE

3.2 MPH

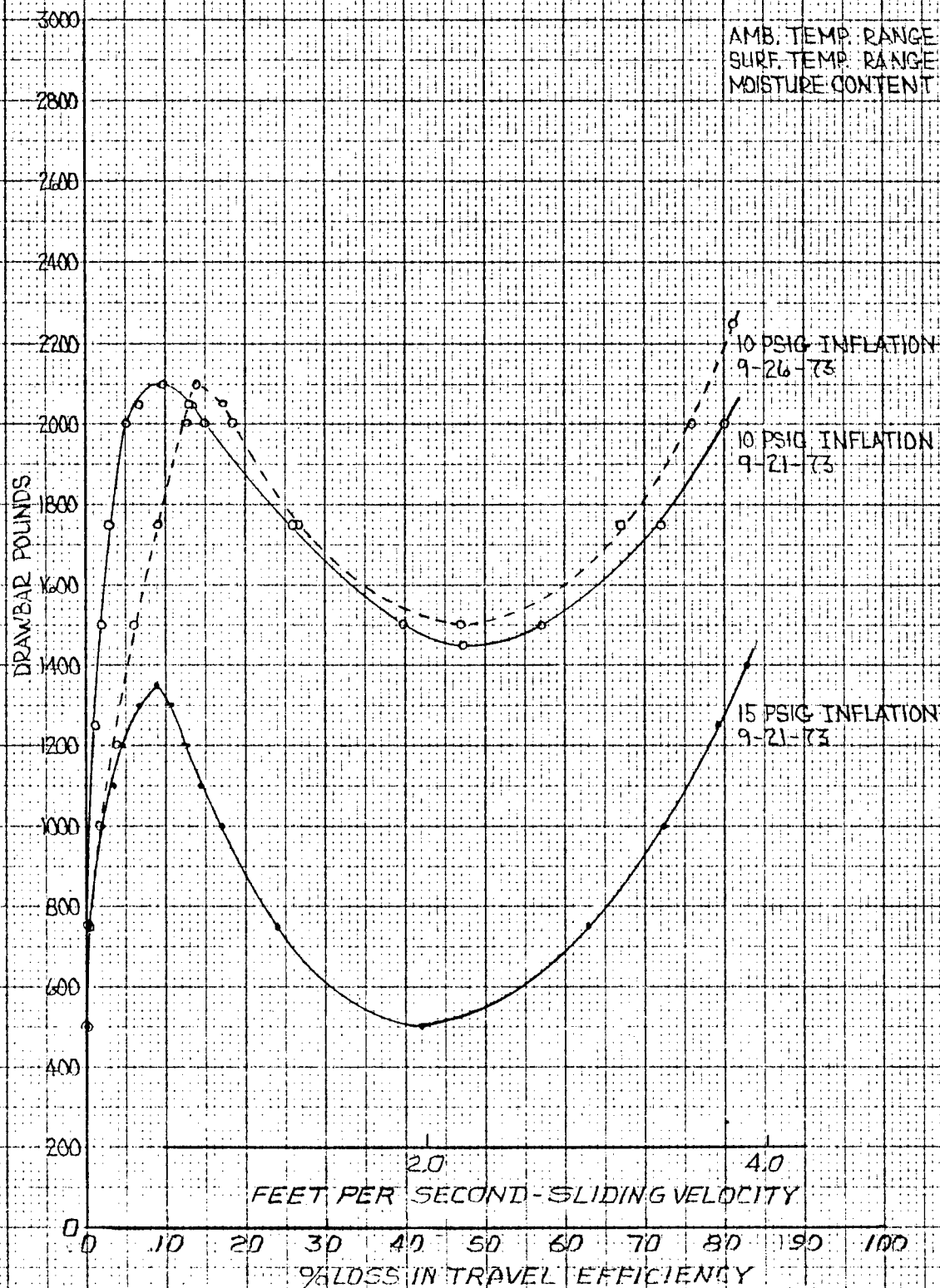
FIGURE NO. 8

Location: SAND MOUNTAIN, NEVADA

Date: 9-21 & 26-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 55-78°F
SURF. TEMP. RANGE 54-84°F
MOISTURE CONTENT .30-.45%



TEST DATA

DRY SANDDate: 9-21-73 Time: 12:45 PM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: GInflation, psig: 15 Ambient Temp. °F.: 78 Surface Temp. °F.: 84Relative Humidity %: 55 Wind Speed, mph: 1 Wind Direction: NE

Sand Moisture Content, % (at course location):	Sample Depth, Inches		
	3	9	18
200 Feet:	.30	.45	.35
400 Feet:	.40	.35	.35

Run Number:	Left Rear				Right Rear			
	1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:	5.50	5.50	5.13	5.50	5.00	4.75	5.63	4.25
Tire Track Width, Ins.:	23.00	22.00	22.00	23.50	23.50	22.00	23.00	23.00
Cone Penetrometer Readings in Track								
3"	20	20	15	20	15	10	15	25
6"	65	60	55	55	45	35	60	65
9"	90	95	90	85	110	135	95	90
12"	110	175	130	145	195	100	135	125
15"	290	05	05	05	05	290	235	275
18"	05	-	-	-	-	05	05	05
21"	-	-	-	-	-	-	-	-
24"	-	-	-	-	-	-	-	-
Cone Penetrometer Readings in Virgin Sand								
3"	10	15	20	20	20	15	10	20
6"	35	45	35	35	35	25	15	35
9"	45	45	35	40	35	30	30	30
12"	50	40	35	40	35	30	40	25
15"	55	45	40	65	90	70	105	105
18"	215	05	290	05	05	225	05	290
21"	05	-	05	-	-	05	-	05
24"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Track, psi								
3"	21	21	21	24	22	25	28	23
6"	69	54	59	51	60	52	52	57
9"	95	94	97	96	101	104	97	105
Cone Penetrometer Readings in Virgin Sand, psi								
3"	21	24	25	21	24	26	21	21
6"	33	38	34	38	34	40	31	33
9"	55	44	44	53	39	37	53	35

	Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:		-	-	-	-
Front Down:		1.0	1.5	1.5	1.5

Tire Hop Frequency, Hz 3.0

Comments: _____

TEST DATA

DRY SAND

Date: 9-21-73 Time: 1:10 PM Test Vehicle: M-34 6 WHEEL DRIVE
 Vehicle Weight, Truck: 11,556 LBS Trailer: NA Tire Group: G
 Inflation, psig: 10 Ambient Temp. °F.: 78 Surface Temp. °F.: 84
 Relative Humidity %: 55 Wind Speed, mph: 1 Wind Direction: NE

Sand Moisture Content, % (at course location): 200 Feet: 30 45 35
 400 Feet: 40 35 35

Run Number:	Left Rear				Right Rear			
	1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:	<u>3.88</u>	<u>4.00</u>	<u>4.00</u>	<u>3.25</u>	<u>3.88</u>	<u>4.00</u>	<u>4.00</u>	<u>4.50</u>
Tire Track Width, Ins.:	<u>19.00</u>	<u>19.00</u>	<u>20.00</u>	<u>18.00</u>	<u>18.50</u>	<u>18.50</u>	<u>19.00</u>	<u>18.25</u>
Cone Penetrometer Readings in Track	3"	<u>25</u>	<u>10</u>	<u>25</u>	<u>15</u>	<u>35</u>	<u>20</u>	<u>25</u>
	6"	<u>75</u>	<u>80</u>	<u>65</u>	<u>55</u>	<u>70</u>	<u>85</u>	<u>70</u>
	9"	<u>80</u>	<u>80</u>	<u>85</u>	<u>70</u>	<u>65</u>	<u>110</u>	<u>95</u>
	12"	<u>235</u>	<u>75</u>	<u>95</u>	<u>80</u>	<u>105</u>	<u>125</u>	<u>130</u>
	15"	<u>05</u>	<u>195</u>	<u>205</u>	<u>180</u>	<u>195</u>	<u>245</u>	<u>215</u>
	18"	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>20</u>	<u>30</u>	<u>25</u>	<u>25</u>	<u>30</u>	<u>20</u>	<u>20</u>
	6"	<u>45</u>	<u>50</u>	<u>55</u>	<u>45</u>	<u>50</u>	<u>50</u>	<u>55</u>
	9"	<u>60</u>	<u>55</u>	<u>60</u>	<u>60</u>	<u>45</u>	<u>50</u>	<u>75</u>
	12"	<u>65</u>	<u>65</u>	<u>70</u>	<u>70</u>	<u>60</u>	<u>40</u>	<u>90</u>
	15"	<u>80</u>	<u>90</u>	<u>90</u>	<u>95</u>	<u>05</u>	<u>30</u>	<u>125</u>
	18"	<u>05</u>	<u>290</u>	<u>295</u>	<u>295</u>	<u>-</u>	<u>160</u>	<u>195</u>
	21"	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>05</u>
Plate Penetrometer Readings in Track, psi	3"	<u>29</u>	<u>21</u>	<u>21</u>	<u>28</u>	<u>32</u>	<u>22</u>	<u>23</u>
	6"	<u>56</u>	<u>49</u>	<u>61</u>	<u>49</u>	<u>56</u>	<u>72</u>	<u>79</u>
	9"	<u>103</u>	<u>79</u>	<u>81</u>	<u>92</u>	<u>98</u>	<u>112</u>	<u>87</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>26</u>	<u>30</u>	<u>29</u>	<u>24</u>	<u>27</u>	<u>26</u>	<u>29</u>
	6"	<u>44</u>	<u>51</u>	<u>49</u>	<u>50</u>	<u>39</u>	<u>39</u>	<u>56</u>
	9"	<u>68</u>	<u>72</u>	<u>70</u>	<u>69</u>	<u>39</u>	<u>44</u>	<u>92</u>

Run Number: 1 2 3 4
 Test Vehicle Attitude at Stall, % - Front Up: - - - -
 Front Down: 1.0 1.0 2.0 2.0

Tire Hop Frequency, Hz 2.6

Comments: _____

TEST DATA

DRY SANDDate: 9-26-73 Time: 9:25 AM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: 4Inflation, psig: 10 Ambient Temp. °F.: 55 Surface Temp. °F.: 54Relative Humidity %: 60 Wind Speed, mph: 8 Wind Direction: ENE

		Sample Depth, Inches
		3 9 18
Sand Moisture Content, % (at course location):	200 Feet:	<u>.35</u> <u>.30</u> <u>.45</u>
	400 Feet:	<u>.35</u> <u>.35</u> <u>.40</u>

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>5.00</u>	<u>6.25</u>	<u>6.00</u>	<u>5.50</u>	<u>5.25</u>	<u>5.00</u>	<u>6.00</u>	<u>6.00</u>
Tire Track Width, Ins.:		<u>22.50</u>	<u>22.50</u>	<u>23.00</u>	<u>23.00</u>	<u>22.50</u>	<u>23.00</u>	<u>22.50</u>	<u>23.00</u>
Cone Penetrometer Readings in Track	3"	<u>15</u>	<u>20</u>	<u>25</u>	<u>20</u>	<u>15</u>	<u>25</u>	<u>20</u>	<u>25</u>
	6"	<u>70</u>	<u>55</u>	<u>55</u>	<u>35</u>	<u>80</u>	<u>85</u>	<u>90</u>	<u>70</u>
	9"	<u>95</u>	<u>120</u>	<u>80</u>	<u>85</u>	<u>100</u>	<u>85</u>	<u>100</u>	<u>90</u>
	12"	<u>120</u>	<u>190</u>	<u>85</u>	<u>05</u>	<u>145</u>	<u>205</u>	<u>160</u>	<u>110</u>
	15"	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>15</u>	<u>10</u>	<u>10</u>	<u>15</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
	6"	<u>25</u>	<u>20</u>	<u>30</u>	<u>25</u>	<u>25</u>	<u>15</u>	<u>25</u>	<u>25</u>
	9"	<u>25</u>	<u>20</u>	<u>35</u>	<u>30</u>	<u>30</u>	<u>35</u>	<u>35</u>	<u>40</u>
	12"	<u>25</u>	<u>20</u>	<u>35</u>	<u>30</u>	<u>30</u>	<u>35</u>	<u>40</u>	<u>50</u>
	15"	<u>20</u>	<u>20</u>	<u>45</u>	<u>25</u>	<u>30</u>	<u>25</u>	<u>55</u>	<u>60</u>
	18"	<u>290</u>	<u>245</u>	<u>235</u>	<u>290</u>	<u>165</u>	<u>285</u>	<u>285</u>	<u>200</u>
	21"	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	3"	<u>22</u>	<u>32</u>	<u>28</u>	<u>29</u>	<u>23</u>	<u>35</u>	<u>27</u>	<u>34</u>
	6"	<u>59</u>	<u>59</u>	<u>71</u>	<u>67</u>	<u>61</u>	<u>71</u>	<u>77</u>	<u>73</u>
	9"	<u>98</u>	<u>96</u>	<u>91</u>	<u>81</u>	<u>103</u>	<u>109</u>	<u>87</u>	<u>95</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>21</u>	<u>17</u>	<u>23</u>	<u>22</u>	<u>19</u>	<u>19</u>	<u>23</u>	<u>21</u>
	6"	<u>30</u>	<u>28</u>	<u>28</u>	<u>33</u>	<u>33</u>	<u>34</u>	<u>33</u>	<u>34</u>
	9"	<u>31</u>	<u>38</u>	<u>35</u>	<u>40</u>	<u>43</u>	<u>44</u>	<u>45</u>	<u>43</u>

	Run Number:	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Test Vehicle Attitude at Stall, % - Front Up:		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:		<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>

Tire Hop Frequency, Hz 2.6

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY SAND

GROUP J RUN NO. 8

6 WHEEL DRIVE

3.2 MPH

FIGURE NO. 9

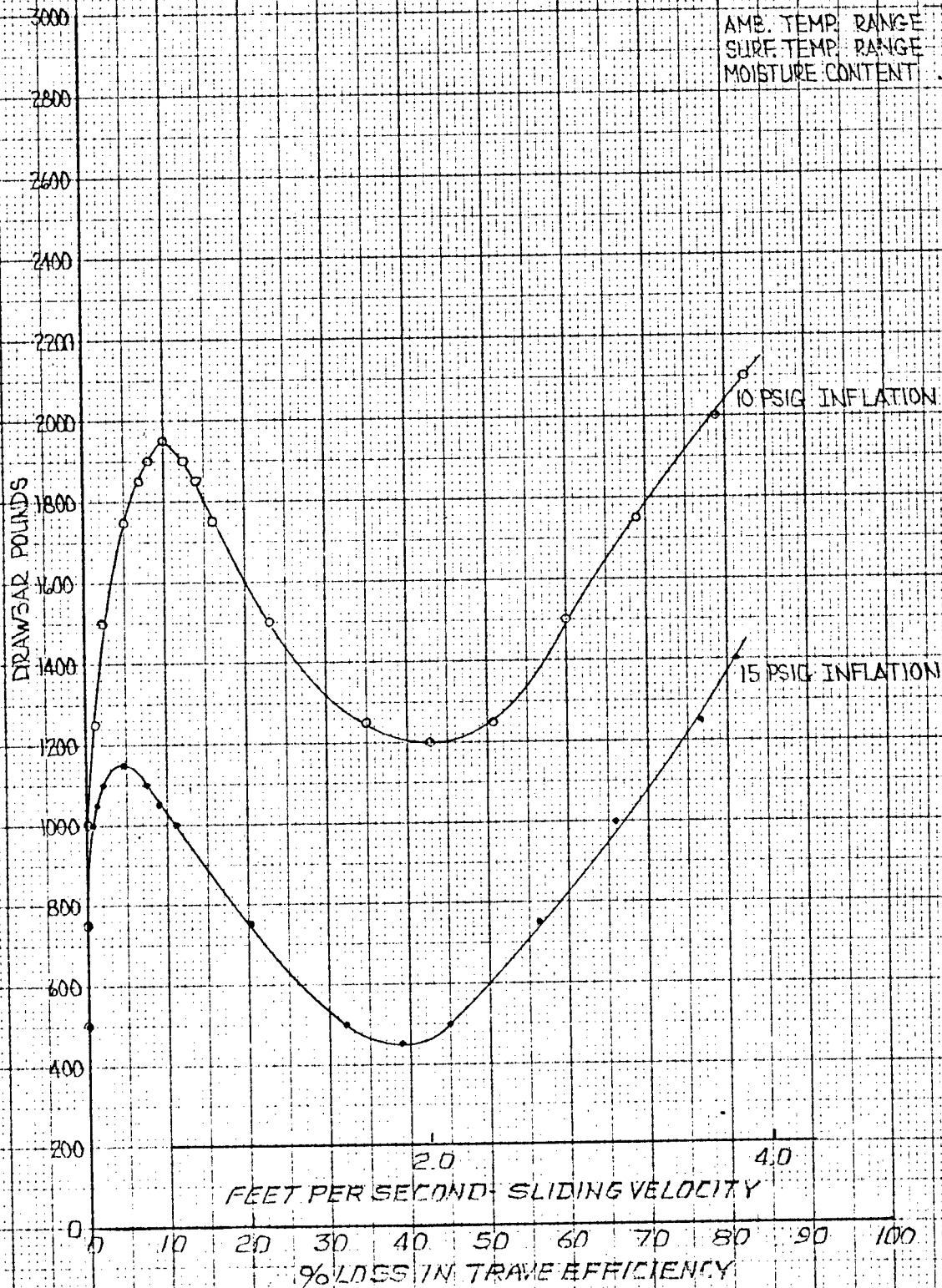
Location: SAND MOUNTAIN, NEVADA

Date: 9-26-73

Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 61°F
SURE TEMP. RANGE 60°F
MOISTURE CONTENT .30-.45%



TEST DATA

DRY SANDDate: 9-26-73 Time: 10:15 AM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: JInflation, psig: 15 Ambient Temp. °F.: 61 Surface Temp. °F.: 60Relative Humidity %: 43 Wind Speed, mph: 10 Wind Direction: E

	Sample Depth, Inches		
	3	9	18
Sand Moisture Content, % (at course location): 200 Feet:	<u>.35</u>	<u>.30</u>	<u>.45</u>
400 Feet:	<u>.35</u>	<u>.35</u>	<u>.40</u>

		Left Rear				Right Rear			
Run Number:		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>4.25</u>	<u>4.00</u>	<u>4.25</u>	<u>5.00</u>	<u>4.75</u>	<u>3.50</u>	<u>4.25</u>	<u>5.00</u>
Tire Track Width, Ins.:		<u>24.00</u>	<u>24.00</u>	<u>24.25</u>	<u>23.00</u>	<u>24.00</u>	<u>24.00</u>	<u>22.50</u>	<u>24.00</u>
Cone Penetrometer Readings in Track	3"	<u>20</u>	<u>15</u>	<u>10</u>	<u>20</u>	<u>15</u>	<u>20</u>	<u>10</u>	<u>15</u>
	6"	<u>45</u>	<u>45</u>	<u>40</u>	<u>70</u>	<u>55</u>	<u>60</u>	<u>75</u>	<u>50</u>
	9"	<u>90</u>	<u>85</u>	<u>140</u>	<u>90</u>	<u>85</u>	<u>105</u>	<u>90</u>	<u>90</u>
	12"	<u>105</u>	<u>130</u>	<u>160</u>	<u>90</u>	<u>225</u>	<u>225</u>	<u>160</u>	<u>190</u>
	15"	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>15</u>	<u>10</u>	<u>10</u>	<u>10</u>
	6"	<u>30</u>	<u>25</u>	<u>30</u>	<u>20</u>	<u>30</u>	<u>30</u>	<u>30</u>	<u>20</u>
	9"	<u>40</u>	<u>30</u>	<u>40</u>	<u>30</u>	<u>35</u>	<u>35</u>	<u>30</u>	<u>25</u>
	12"	<u>45</u>	<u>30</u>	<u>50</u>	<u>35</u>	<u>35</u>	<u>40</u>	<u>30</u>	<u>30</u>
	15"	<u>75</u>	<u>40</u>	<u>85</u>	<u>50</u>	<u>60</u>	<u>40</u>	<u>55</u>	<u>25</u>
	18"	<u>285</u>	<u>285</u>	<u>05</u>	<u>290</u>	<u>290</u>	<u>05</u>	<u>05</u>	<u>230</u>
	21"	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>-</u>	<u>05</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	3"	<u>76</u>	<u>21</u>	<u>21</u>	<u>21</u>	<u>29</u>	<u>21</u>	<u>20</u>	<u>29</u>
	6"	<u>59</u>	<u>39</u>	<u>48</u>	<u>48</u>	<u>64</u>	<u>51</u>	<u>59</u>	<u>57</u>
	9"	<u>105</u>	<u>101</u>	<u>83</u>	<u>95</u>	<u>110</u>	<u>105</u>	<u>103</u>	<u>107</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>19</u>	<u>13</u>	<u>19</u>	<u>21</u>	<u>17</u>	<u>15</u>	<u>15</u>	<u>19</u>
	6"	<u>34</u>	<u>28</u>	<u>32</u>	<u>31</u>	<u>28</u>	<u>36</u>	<u>21</u>	<u>35</u>
	9"	<u>41</u>	<u>37</u>	<u>41</u>	<u>39</u>	<u>38</u>	<u>45</u>	<u>39</u>	<u>49</u>

	Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:		<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.5</u>

Tire Hop Frequency, Hz 2.7

Comments: _____

TEST DATA

DRY SANDDate: 9-26-73 Time: 10:35 AM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,534 LBS Trailer: NA Tire Group: JInflation, psig: 10 Ambient Temp. °F.: 61 Surface Temp. °F.: 60Relative Humidity %: 48 Wind Speed, mph: 10 Wind Direction: E

		Sample Depth, Inches
		3 9 18
Sand Moisture Content, % (at course location):	200 Feet:	<u>.35</u> <u>.30</u> <u>.45</u>
	400 Feet:	<u>.35</u> <u>.35</u> <u>.40</u>

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>5.00</u>	<u>4.75</u>	<u>4.50</u>	<u>5.50</u>	<u>5.50</u>	<u>5.75</u>	<u>4.50</u>	<u>6.00</u>
Tire Track Width, Ins.:		<u>21.50</u>	<u>22.50</u>	<u>22.00</u>	<u>22.00</u>	<u>22.00</u>	<u>24.00</u>	<u>24.00</u>	<u>23.00</u>
Cone Penetrometer Readings in Track	3"	<u>20</u>	<u>20</u>	<u>10</u>	<u>10</u>	<u>15</u>	<u>25</u>	<u>20</u>	<u>20</u>
	6"	<u>80</u>	<u>75</u>	<u>70</u>	<u>90</u>	<u>35</u>	<u>75</u>	<u>55</u>	<u>70</u>
	9"	<u>95</u>	<u>170</u>	<u>90</u>	<u>80</u>	<u>120</u>	<u>90</u>	<u>105</u>	<u>95</u>
	12"	<u>175</u>	<u>195</u>	<u>175</u>	<u>105</u>	<u>190</u>	<u>180</u>	<u>155</u>	<u>145</u>
	15"	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>15</u>	<u>15</u>	<u>10</u>
	6"	<u>25</u>	<u>25</u>	<u>25</u>	<u>30</u>	<u>20</u>	<u>25</u>	<u>35</u>	<u>20</u>
	9"	<u>35</u>	<u>30</u>	<u>30</u>	<u>40</u>	<u>30</u>	<u>30</u>	<u>45</u>	<u>40</u>
	12"	<u>40</u>	<u>40</u>	<u>35</u>	<u>45</u>	<u>40</u>	<u>25</u>	<u>50</u>	<u>50</u>
	15"	<u>80</u>	<u>80</u>	<u>80</u>	<u>70</u>	<u>70</u>	<u>120</u>	<u>70</u>	<u>85</u>
	18"	<u>290</u>	<u>265</u>	<u>170</u>	<u>275</u>	<u>285</u>	<u>290</u>	<u>80</u>	<u>290</u>
	21"	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>265</u>	<u>05</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>05</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	3"	<u>23</u>	<u>22</u>	<u>23</u>	<u>23</u>	<u>27</u>	<u>25</u>	<u>25</u>	<u>29</u>
	6"	<u>67</u>	<u>57</u>	<u>45</u>	<u>46</u>	<u>58</u>	<u>65</u>	<u>49</u>	<u>55</u>
	9"	<u>99</u>	<u>103</u>	<u>97</u>	<u>95</u>	<u>99</u>	<u>106</u>	<u>97</u>	<u>100</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>19</u>	<u>17</u>	<u>21</u>	<u>19</u>	<u>22</u>	<u>21</u>	<u>19</u>	<u>15</u>
	6"	<u>27</u>	<u>23</u>	<u>26</u>	<u>32</u>	<u>26</u>	<u>35</u>	<u>28</u>	<u>29</u>
	9"	<u>38</u>	<u>31</u>	<u>38</u>	<u>34</u>	<u>35</u>	<u>47</u>	<u>32</u>	<u>39</u>

	Run Number:	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Test Vehicle Attitude at Stall, % - Front Up:		<u>0.0</u>	<u>0.0</u>	<u>-</u>	<u>-</u>
Front Down:		<u>0.0</u>	<u>0.0</u>	<u>0.5</u>	<u>1.0</u>

Tire Hop Frequency, Hz 2.3

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY SAND

GROUP: D RUN NO. 9

6-WHEEL DRIVE

3.2 MPH

FIGURE NO. 10

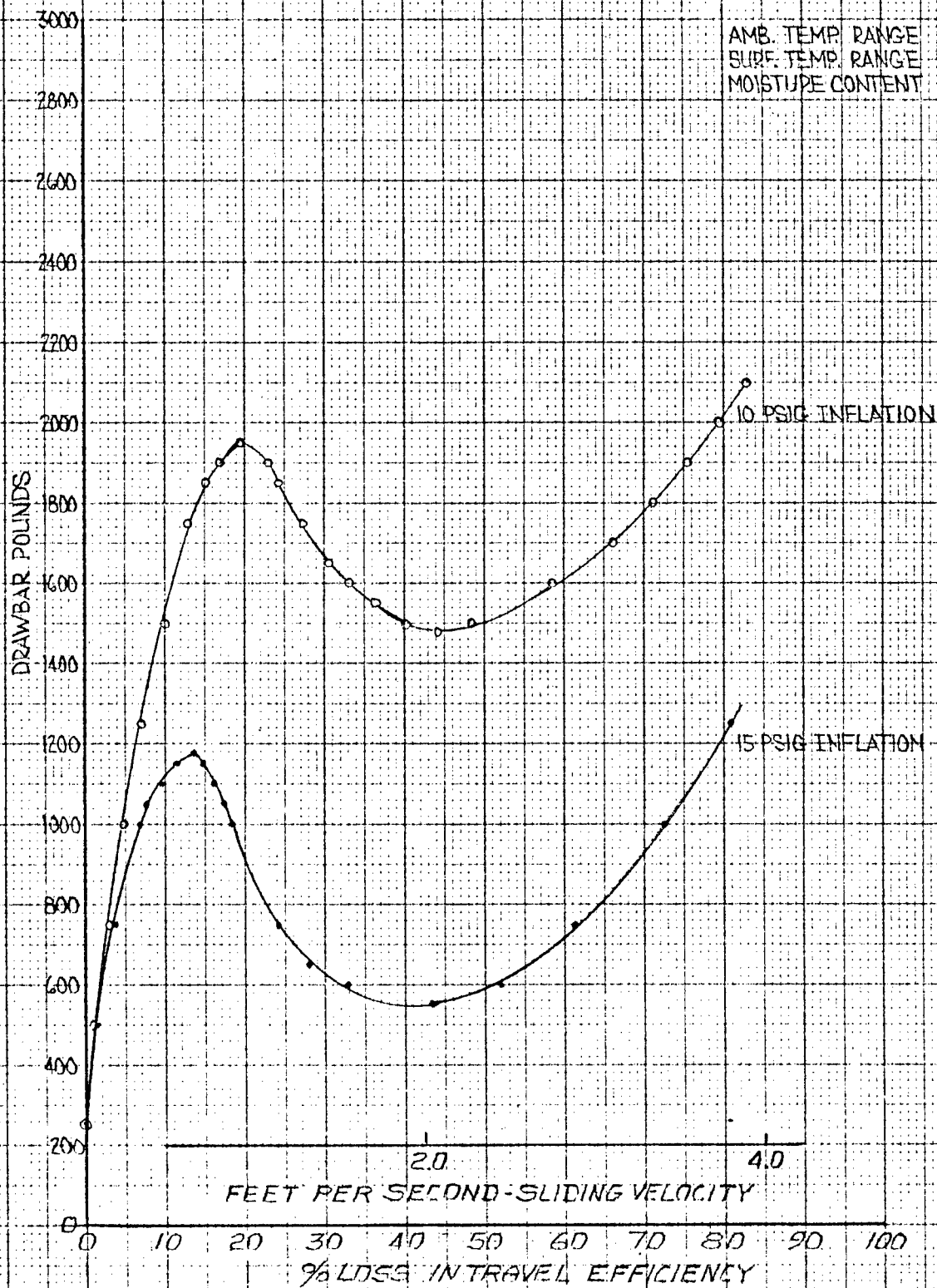
Location: SAND MOUNTAIN, NEVADA

Date: 9-26-73

Test By: WHS

Data By: WHS

AMB. TEMP RANGE 70°F
SURF. TEMP RANGE 86°F
MOISTURE CONTENT .30-.40%



TEST DATA

DRY SANDDate: 9-26-73 Time: 11:40 AM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: DInflation, psig: 15 Ambient Temp. °F.: 70 Surface Temp. °F.: 86Relative Humidity %: 30 Wind Speed, mph: 1 Wind Direction: E

	Sample Depth, Inches		
	3	9	18
Sand Moisture Content, % (at course location): 200 Feet:	<u>.30</u>	<u>.35</u>	<u>.35</u>
400 Feet:	<u>.35</u>	<u>.40</u>	<u>.40</u>

		Left Rear				Right Rear			
Run Number:		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>5.00</u>	<u>5.15</u>	<u>5.50</u>	<u>6.00</u>	<u>5.00</u>	<u>5.25</u>	<u>5.00</u>	<u>5.50</u>
Tire Track Width, Ins.:		<u>22.50</u>	<u>22.00</u>	<u>21.50</u>	<u>22.50</u>	<u>23.50</u>	<u>23.50</u>	<u>23.00</u>	<u>24.00</u>
Cone Penetrometer	3"	<u>20</u>	<u>20</u>	<u>15</u>	<u>10</u>	<u>20</u>	<u>15</u>	<u>10</u>	<u>20</u>
Readings in Track	6"	<u>65</u>	<u>60</u>	<u>70</u>	<u>80</u>	<u>55</u>	<u>55</u>	<u>35</u>	<u>70</u>
	9"	<u>85</u>	<u>90</u>	<u>85</u>	<u>90</u>	<u>130</u>	<u>110</u>	<u>140</u>	<u>95</u>
	12"	<u>175</u>	<u>105</u>	<u>130</u>	<u>110</u>	<u>225</u>	<u>205</u>	<u>185</u>	<u>155</u>
	15"	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer	3"	<u>10</u>	<u>10</u>	<u>10</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>10</u>	<u>10</u>
Readings in	6"	<u>30</u>	<u>30</u>	<u>20</u>	<u>30</u>	<u>20</u>	<u>30</u>	<u>30</u>	<u>20</u>
Virgin Sand	9"	<u>40</u>	<u>40</u>	<u>25</u>	<u>40</u>	<u>20</u>	<u>30</u>	<u>30</u>	<u>30</u>
	12"	<u>45</u>	<u>40</u>	<u>25</u>	<u>40</u>	<u>25</u>	<u>25</u>	<u>30</u>	<u>30</u>
	15"	<u>45</u>	<u>45</u>	<u>55</u>	<u>100</u>	<u>25</u>	<u>70</u>	<u>110</u>	<u>55</u>
	18"	<u>245</u>	<u>275</u>	<u>270</u>	<u>285</u>	<u>235</u>	<u>05</u>	<u>285</u>	<u>270</u>
	21"	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer	3"	<u>28</u>	<u>25</u>	<u>26</u>	<u>28</u>	<u>22</u>	<u>29</u>	<u>21</u>	<u>25</u>
Readings in Track,	6"	<u>64</u>	<u>64</u>	<u>59</u>	<u>57</u>	<u>70</u>	<u>71</u>	<u>66</u>	<u>66</u>
psi	9"	<u>95</u>	<u>93</u>	<u>101</u>	<u>98</u>	<u>98</u>	<u>102</u>	<u>102</u>	<u>101</u>
Cone Penetrometer	3"	<u>17</u>	<u>21</u>	<u>18</u>	<u>24</u>	<u>21</u>	<u>22</u>	<u>24</u>	<u>22</u>
Readings in	6"	<u>29</u>	<u>39</u>	<u>26</u>	<u>39</u>	<u>29</u>	<u>32</u>	<u>35</u>	<u>32</u>
Virgin Sand, psi	9"	<u>36</u>	<u>39</u>	<u>29</u>	<u>40</u>	<u>32</u>	<u>42</u>	<u>39</u>	<u>44</u>

	Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:		<u>1.0</u>	<u>1.5</u>	<u>1.0</u>	<u>1.0</u>

Tire Hop Frequency, Hz 2.6

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SANDDate: 9-26-73 Time: 12:00 PM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,526 LBS Trailer: NA Tire Group: DInflation, psig: 10 Ambient Temp. °F.: 70 Surface Temp. °F.: 86Relative Humidity %: 30 Wind Speed, mph: 1 Wind Direction: E

		Sample Depth, Inches
		3 9 18
Sand Moisture Content, % (at course location):	200 Feet:	<u>.30</u> <u>.35</u> <u>.35</u>
	400 Feet:	<u>.35</u> <u>.40</u> <u>.40</u>

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>5.00</u>	<u>5.50</u>	<u>5.50</u>	<u>5.25</u>	<u>5.50</u>	<u>5.50</u>	<u>6.00</u>	<u>5.15</u>
Tire Track Width, Ins.:		<u>20.50</u>	<u>22.00</u>	<u>21.50</u>	<u>19.50</u>	<u>20.50</u>	<u>21.50</u>	<u>20.50</u>	<u>21.00</u>
Cone Penetrometer Readings in Track	3"	<u>20</u>	<u>35</u>	<u>15</u>	<u>10</u>	<u>20</u>	<u>30</u>	<u>5</u>	<u>10</u>
	6"	<u>80</u>	<u>75</u>	<u>80</u>	<u>35</u>	<u>60</u>	<u>70</u>	<u>25</u>	<u>30</u>
	9"	<u>95</u>	<u>80</u>	<u>90</u>	<u>110</u>	<u>75</u>	<u>80</u>	<u>90</u>	<u>130</u>
	12"	<u>155</u>	<u>230</u>	<u>90</u>	<u>170</u>	<u>215</u>	<u>280</u>	<u>165</u>	<u>230</u>
	15"	<u>05</u>	<u>05</u>	<u>05</u>	<u>215</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>05</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>5</u>	<u>10</u>	<u>5</u>	<u>10</u>	<u>10</u>	<u>5</u>	<u>10</u>	<u>5</u>
	6"	<u>20</u>	<u>25</u>	<u>20</u>	<u>35</u>	<u>20</u>	<u>20</u>	<u>25</u>	<u>15</u>
	9"	<u>25</u>	<u>25</u>	<u>30</u>	<u>40</u>	<u>30</u>	<u>30</u>	<u>25</u>	<u>30</u>
	12"	<u>25</u>	<u>25</u>	<u>30</u>	<u>45</u>	<u>40</u>	<u>30</u>	<u>30</u>	<u>40</u>
	15"	<u>40</u>	<u>60</u>	<u>60</u>	<u>45</u>	<u>75</u>	<u>45</u>	<u>45</u>	<u>50</u>
	18"	<u>280</u>	<u>05</u>	<u>290</u>	<u>225</u>	<u>290</u>	<u>280</u>	<u>285</u>	<u>210</u>
	21"	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>05</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	3"	<u>30</u>	<u>34</u>	<u>33</u>	<u>26</u>	<u>33</u>	<u>38</u>	<u>35</u>	<u>39</u>
	6"	<u>65</u>	<u>64</u>	<u>78</u>	<u>65</u>	<u>83</u>	<u>73</u>	<u>65</u>	<u>67</u>
	9"	<u>100</u>	<u>86</u>	<u>100</u>	<u>90</u>	<u>94</u>	<u>96</u>	<u>89</u>	<u>93</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>26</u>	<u>19</u>	<u>19</u>	<u>24</u>	<u>26</u>	<u>16</u>	<u>17</u>	<u>16</u>
	6"	<u>28</u>	<u>25</u>	<u>27</u>	<u>41</u>	<u>26</u>	<u>26</u>	<u>25</u>	<u>25</u>
	9"	<u>42</u>	<u>25</u>	<u>37</u>	<u>58</u>	<u>32</u>	<u>29</u>	<u>33</u>	<u>30</u>

	Run Number:	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Test Vehicle Attitude at Stall, % - Front Up:		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Front Down:		<u>1.0</u>	<u>1.5</u>	<u>1.0</u>	<u>1.0</u>

Tire Hop Frequency, Hz 2.3

Comments: _____

TEST DATA

Figures 11 through 14

Dynamic Traction - Dry Sand, Rerun Group A

Nevada Automotive Test Center

Project: ED-17-30DYNAMIC TRACTION
RATING

DRY SAND

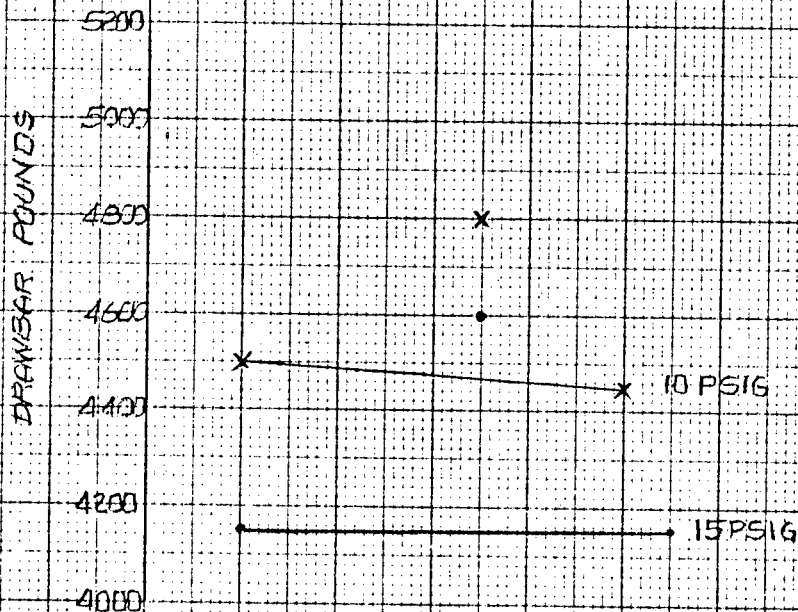
DRAWBAR PULL A PEAK TRACTION2.5 MPH

FIGURE NO. 11

Location: SAND MOUNTAINDate: 4-26-74 Test By: WHSData By: JED

NOTE: RERUN OF 'A' GROUP WITH
DIRECTIONAL TREAD PROPERLY
MOUNTED.

IN THE ORIGINAL RUN THE
RATINGS FOR THE 'A' GROUP
MOUNTED INCORRECTLY
COMPARED TO THE 'C' GROUP
WAS: 10 PSIG 103%
15 PSIG 109%



RATING @ 10 PSIG

RATING @ 15 PSIG

AVE. DE LBS @ 10 PSIG x

AVE. DE LBS @ 15 PSIG *

CODE

AMB. TEMP °F

SURF. TEMP °F

100

107

100

100

111

100

4500

4800

4450

4150

4150

4150

C

A

C

58

60

60

72

72

72

Nevada Automotive Test Center

Project 20-17-30

DYNAMIC TRACTION

DRY SAND
GROUP: C RUN NO. 1
6 WHEEL DRIVE
2.5 MPH
FIGURE NO. 12

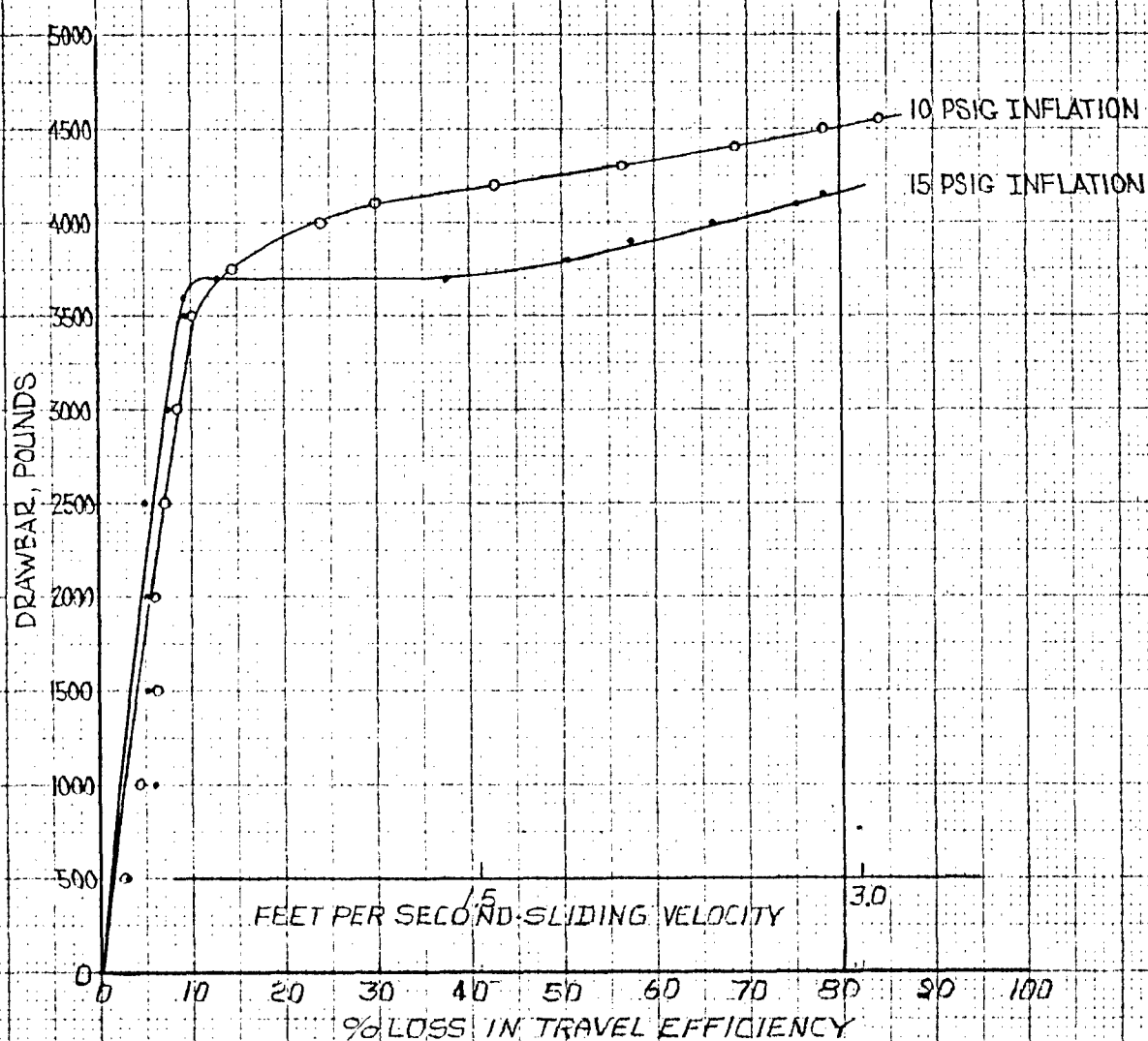
Location: SAND MOUNTAIN, NEVADA

Date: 4-26-74 Test By: DLG

Data By: WHS

AMB. TEMP. 58°F
SURF. TEMP. 72°F

NOTE: CONTROL RUN #1 FOR RERUN
OF "A" GROUP WITH DIRECTIONAL
TREAD CORRECTLY MOUNTED.



TEST DATA

DRY SANDDate: 4-26-74 Time: 10:30 AM Test Vehicle: M34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: CInflation, psig: 15 Ambient Temp. °F.: 44 Surface Temp. °F.: 52Relative Humidity %: 42 Wind Speed, mph: 8 Wind Direction: WNW

Sample Depth, Inches:

3 9 18

Sand Moisture Content, % (at course location): 200 Feet:

400 Feet:

Run Number:	Left Rear				Right Rear			
	1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:	<u>3.75</u>	<u>2.25</u>	<u>2.5</u>	<u>-</u>	<u>3.5</u>	<u>3.0</u>	<u>2.75</u>	<u>-</u>
Tire Track Width, Ins.:	<u>13.75</u>	<u>12.125</u>	<u>12.5</u>	<u>-</u>	<u>13.5</u>	<u>13.25</u>	<u>12.5</u>	<u>-</u>
Cone Penetrometer 3"	<u>39</u>	<u>51</u>	<u>54</u>	<u>-</u>	<u>40</u>	<u>50</u>	<u>50</u>	<u>-</u>
Readings in Track 6"	<u>290</u>	<u>300</u>	<u>300</u>	<u>-</u>	<u>280</u>	<u>280</u>	<u>290</u>	<u>-</u>
9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>
12"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
15"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer 3"	<u>30</u>	<u>30</u>	<u>35</u>	<u>-</u>	<u>37</u>	<u>28</u>	<u>40</u>	<u>-</u>
Readings in 6"	<u>250</u>	<u>240</u>	<u>220</u>	<u>-</u>	<u>240</u>	<u>270</u>	<u>270</u>	<u>-</u>
Virgin Sand 9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>
12"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
15"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer 3"	<u>48</u>	<u>50</u>	<u>55</u>	<u>-</u>	<u>45</u>	<u>50</u>	<u>50</u>	<u>-</u>
Readings in Track, 6"	<u>105</u>	<u>100</u>	<u>105</u>	<u>-</u>	<u>100</u>	<u>95</u>	<u>100</u>	<u>-</u>
psi 9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
PLATE Cone Penetrometer 3"	<u>40</u>	<u>42</u>	<u>44</u>	<u>-</u>	<u>35</u>	<u>40</u>	<u>42</u>	<u>-</u>
Readings in 6"	<u>100</u>	<u>100</u>	<u>110</u>	<u>-</u>	<u>100</u>	<u>100</u>	<u>105</u>	<u>-</u>
Virgin Sand, psi 9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>-</u>

Run Number: 1 2 3 4

Test Vehicle Attitude at Stall, % - Front Up: - - - -

Front Down: 1% 1% 1% -

Tire Hop Frequency, Hz 0

Comments: _____

OS - Off Scale (Full Scale = 300)

DRY SAND

Date: 4-26 Time: 10:45AM Test Vehicle: M34 6WHEEL DRIVE
 Vehicle Weight, Truck: 11536 LBS Trailer: NA Tire Group: C
 Inflation, psig: 10 Ambient Temp. °F.: 44 Surface Temp. °F.: 52
 Relative Humidity %: 42 Wind Speed, mph: 8 Wind Direction: WNW

Sample Depth, Inches:

Sand Moisture Content, % (at course location): 200 Feet: _____
 400 Feet: _____

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		3.25	3.0	3.25	-	3.5	3.5	3.25	-
Tire Track Width, Ins.:		13.5	13.5	13.0	-	13.25	13.0	13.0	-
Cone Penetrometer	3"	38	40	45	-	40	40	47	-
Readings in Track	6"	280	300	300	-	300	270	280	-
	9"	05	05	05	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Cone Penetrometer	3"	32	32	34	-	35	36	38	-
Readings in	6"	270	240	240	-	250	260	260	-
Virgin Sand	9"	05	05	05	-	05	05	05	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Plate Penetrometer	3"	50	47	50	-	42	47	48	-
Readings in Track,	6"	120	110	120	-	100	110	110	-
psi	9"	05	05	05	-	05	05	05	-
PLATE									
Cone Penetrometer	3"	40	40	41	-	40	41	42	-
Readings in	6"	100	95	100	-	85	95	95	-
Virgin Sand, psi	9"	05	05	05	-	05	05	05	-

Run Number: 1 2 3 4
 Test Vehicle Attitude at Stall, % - Front Up: - - - -
 Front Down: 10% 1% 1% -

Tire Hop Frequency, Hz 0

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY SAND

GROUP A RUN NO. 2

6 WHEEL DRIVE

2.5 MPH

FIGURE NO. 13

Location: SAND MOUNTAIN, NEVADA

Date: 4-26-74

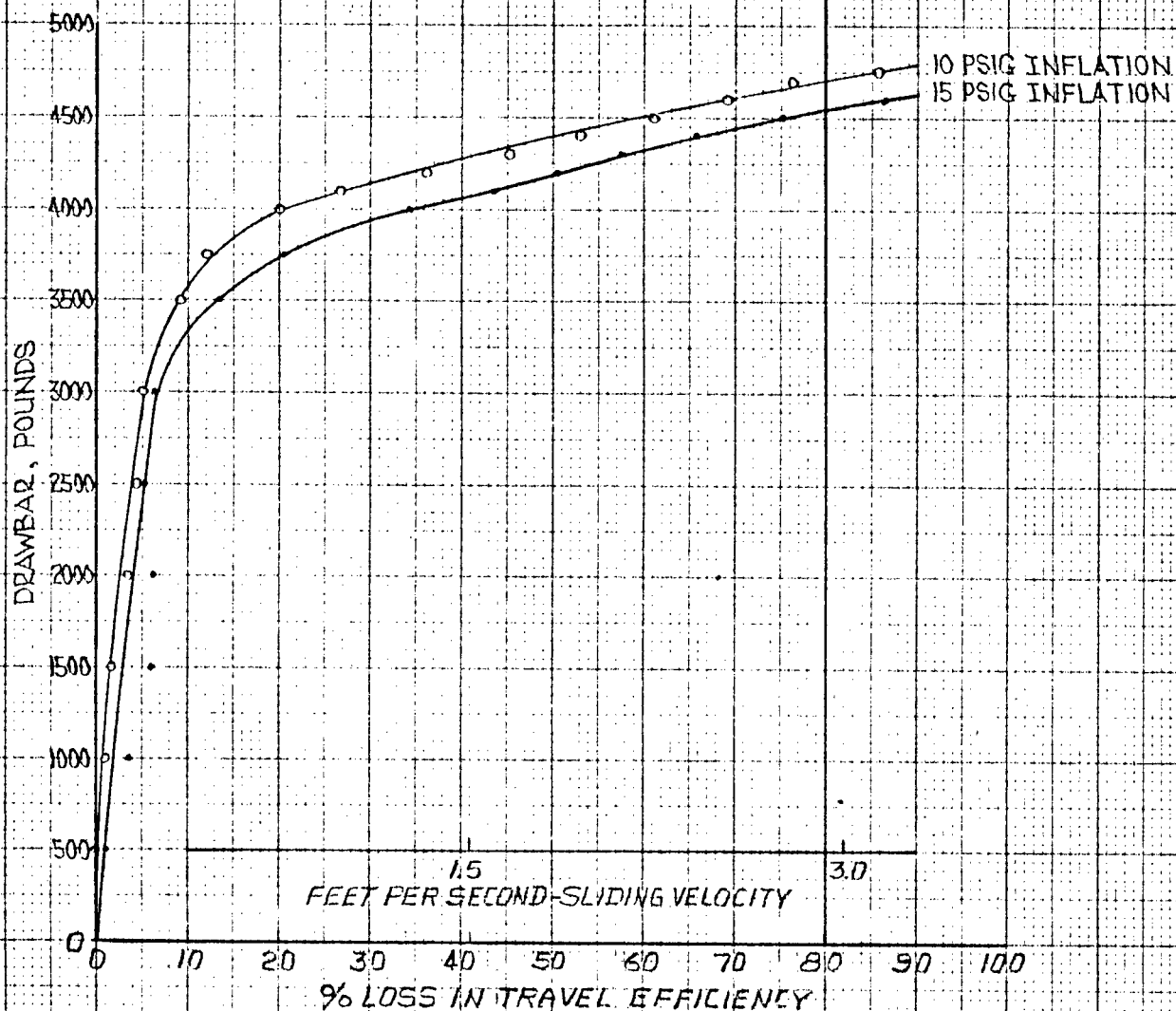
Test By: DLG

Data By: WHS

AMB. TEMP. 60°F

SURF. TEMP. 72°F

NOTE: GROUP A RUN WITH DIRECTIONAL
TREAD CORRECTLY MOUNTED.



TEST DATA

DRY SANDDate: 4-26-74 Time: 12:00 Noon Test Vehicle: M34 6 WHEEL LAP 18Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: AInflation, psig: 15 Ambient Temp. °F.: 51 Surface Temp. °F.: 70Relative Humidity %: 40 Wind Speed, mph: 8 Wind Direction: W

Sample Depth, Inches

Sand Moisture Content, % (at course location): 200 Feet:
400 Feet:

3	9	18
—	—	—
—	—	—

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>2.5</u>	<u>2.25</u>	<u>3.0</u>	<u>—</u>	<u>3.0</u>	<u>2.5</u>	<u>2.5</u>	<u>—</u>
Tire Track Width, Ins.:		<u>13</u>	<u>13.5</u>	<u>13.25</u>	<u>—</u>	<u>13.5</u>	<u>13.25</u>	<u>13.5</u>	<u>—</u>
Cone Penetrometer Readings in Track	3"	<u>47</u>	<u>50</u>	<u>60</u>	<u>—</u>	<u>50</u>	<u>50</u>	<u>60</u>	<u>—</u>
	6"	<u>300</u>	<u>200</u>	<u>200</u>	<u>—</u>	<u>300</u>	<u>200</u>	<u>300</u>	<u>—</u>
	9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer Readings in Track, psi	3"	<u>45</u>	<u>42</u>	<u>45</u>	<u>—</u>	<u>45</u>	<u>46</u>	<u>45</u>	<u>—</u>
	6"	<u>120</u>	<u>100</u>	<u>110</u>	<u>—</u>	<u>110</u>	<u>95</u>	<u>100</u>	<u>—</u>
	9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>
Cone Penetrometer Readings in Virgin Sand, psi	3"	<u>36</u>	<u>37</u>	<u>37</u>	<u>—</u>	<u>37</u>	<u>29</u>	<u>36</u>	<u>—</u>
	6"	<u>90</u>	<u>95</u>	<u>90</u>	<u>—</u>	<u>90</u>	<u>95</u>	<u>95</u>	<u>—</u>
	9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>

	Run Number:	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Test Vehicle Attitude at Stall, % - Front Up:		<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Front Down:		<u>0</u>	<u>1%</u>	<u>0</u>	<u>—</u>

Tire Hop Frequency, Hz 0

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SANDDate: 4-26-74 Time: 12:20 PM Test Vehicle: M34 6WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: AInflation, psig: 10 Ambient Temp. °F.: 51 Surface Temp. °F.: 70Relative Humidity %: 40 Wind Speed, mph: 8 Wind Direction: W

Sand Moisture Content, % (at course location):	Sample Depth, Inches		
	3	9	18
200 Feet:	—	—	—
400 Feet:	—	—	—

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>2.25</u>	<u>2.5</u>	<u>2.75</u>	<u>—</u>	<u>2.5</u>	<u>2.5</u>	<u>2.5</u>	<u>—</u>
Tire Track Width, Ins.:		<u>11.5</u>	<u>11.75</u>	<u>12.0</u>	<u>—</u>	<u>12.0</u>	<u>12.0</u>	<u>12.25</u>	<u>—</u>
Cone Penetrometer Readings in Track	3"	<u>41</u>	<u>39</u>	<u>36</u>	<u>—</u>	<u>40</u>	<u>40</u>	<u>35</u>	<u>—</u>
	6"	<u>280</u>	<u>240</u>	<u>260</u>	<u>—</u>	<u>275</u>	<u>250</u>	<u>250</u>	<u>—</u>
	9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Cone Penetrometer Readings in Virgin Sand	3"	<u>37</u>	<u>35</u>	<u>34</u>	<u>—</u>	<u>34</u>	<u>34</u>	<u>30</u>	<u>—</u>
	6"	<u>240</u>	<u>200</u>	<u>200</u>	<u>—</u>	<u>210</u>	<u>195</u>	<u>190</u>	<u>—</u>
	9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer Readings in Track, psi	3"	<u>48</u>	<u>45</u>	<u>40</u>	<u>—</u>	<u>50</u>	<u>50</u>	<u>45</u>	<u>—</u>
	6"	<u>120</u>	<u>110</u>	<u>90</u>	<u>—</u>	<u>110</u>	<u>110</u>	<u>90</u>	<u>—</u>
	9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>
Plate Penetrometer Readings in Virgin Sand, psi	3"	<u>40</u>	<u>40</u>	<u>36</u>	<u>—</u>	<u>42</u>	<u>42</u>	<u>40</u>	<u>—</u>
	6"	<u>100</u>	<u>100</u>	<u>80</u>	<u>—</u>	<u>90</u>	<u>80</u>	<u>80</u>	<u>—</u>
	9"	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>	<u>05</u>	<u>05</u>	<u>05</u>	<u>—</u>

	Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:		<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Front Down:		<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>

Tire Hop Frequency, Hz 0

Comments: _____

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY SAND

GROUP C RUN NO. 3

6 WHEEL DRIVE

2.5 MPH

FIGURE NO. 14

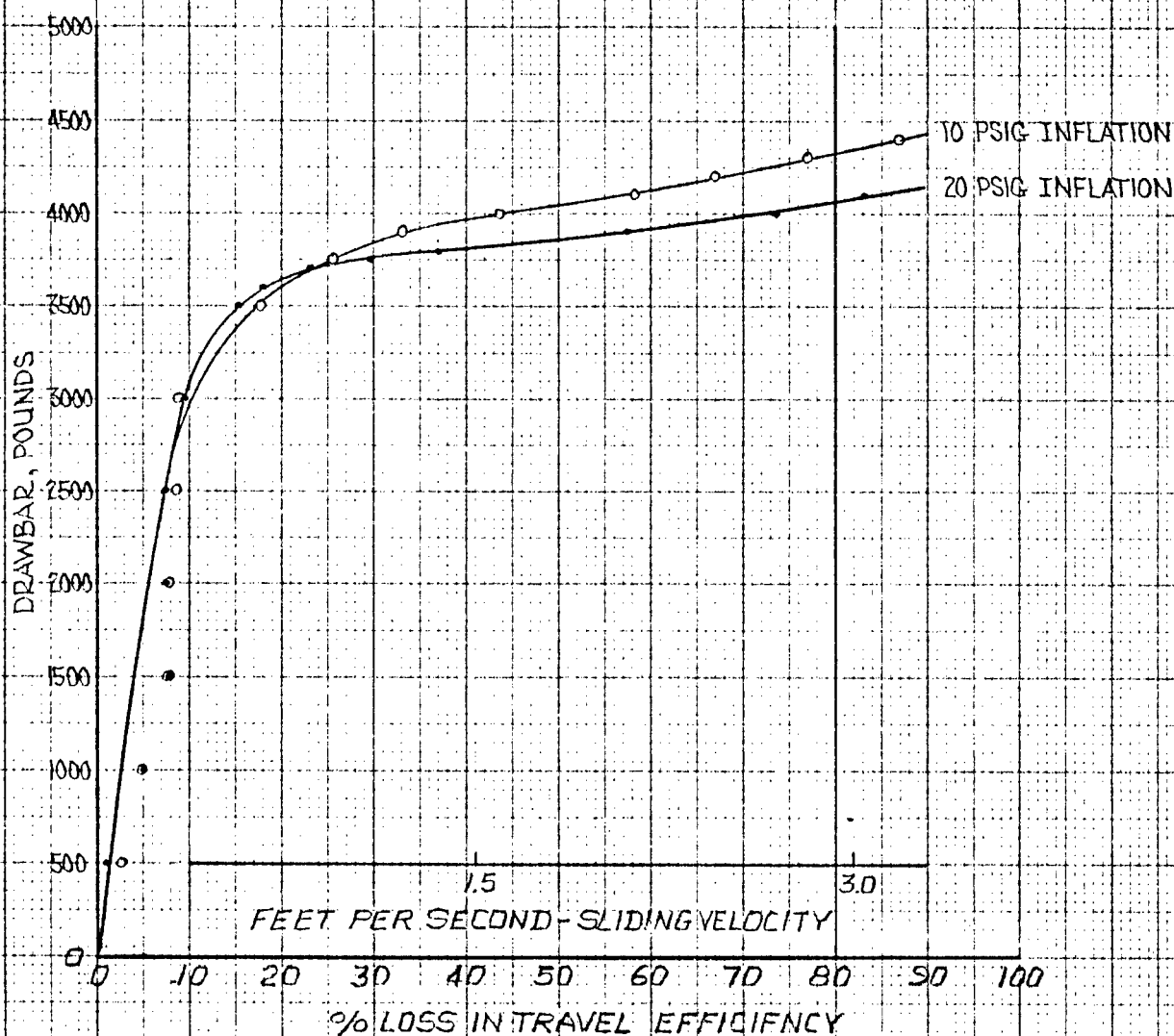
Location: SAND MOUNTAIN, NEVADA

Date: 4-26-74 Test By: DLG

Data By: WHS

AMB. TEMP 60°F
SURF TEMP 72°F

NOTE: CONTROL RUN #2 FOR RERUN
OF "A" GROUP WITH DIRECTIONAL
TREAD CORRECTLY MOUNTED.



TEST DATA

DRY SANDDate: 4-26-74 Time: 1:30PM Test Vehicle: M34 6WHEEL DRIVEVehicle Weight, Truck: 11,536 Lbs Trailer: NA Tire Group: CInflation, psig: 10 Ambient Temp. °F.: 58 Surface Temp. °F.: 72Relative Humidity %: 40 Wind Speed, mph: 8 Wind Direction: W

Sand Moisture Content, % (at course location):	Sample Depth, Inches		
	3	9	18
200 Feet:	—	—	—
400 Feet:	—	—	—

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		2.5	2.25	2.5	—	2.5	2.25	2.5	—
Tire Track Width, Ins.:		12.5	12.0	12.0	—	12.25	12.0	12.0	—
Cone Penetrometer Readings in Track	3"	47	58	47	—	50	60	50	—
	6"	270	300	270	—	260	300	270	—
	9"	05	05	05	—	05	05	05	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
	21"	—	—	—	—	—	—	—	—
	24"	—	—	—	—	—	—	—	—
Cone Penetrometer Readings in Virgin Sand	3"	40	40	41	—	42	45	42	—
	6"	240	255	245	—	245	240	250	—
	9"	05	05	05	—	05	05	05	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
	21"	—	—	—	—	—	—	—	—
	24"	—	—	—	—	—	—	—	—
Plate Penetrometer Readings in Track, psi	3"	46	45	45	—	50	40	45	—
	6"	25	25	20	—	20	100	100	—
	9"	05	05	05	—	05	05	05	—
Plate Penetrometer Readings in Virgin Sand, psi	3"	40	40	40	—	42	36	40	—
	6"	85	85	80	—	80	80	78	—
	9"	05	05	05	—	05	05	05	—

	Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:		—	—	—	—
Front Down:		—	1	—	—

Tire Hop Frequency, Hz 0

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

DRY SANDDate: 4-26-74 Time: 11:45 PM Test Vehicle: M-34 6 WHEEL DRIVEVehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: CInflation, psig: 15 Ambient Temp. °F.: 60 Surface Temp. °F.: 72Relative Humidity %: 40 Wind Speed, mph: 8 Wind Direction: W

Sand Moisture Content, % (at course location):	Sample Depth, Inches		
	3	9	18
200 Feet:	—	—	—
400 Feet:	—	—	—

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		2.25	2	2.5	—	2.5	2.0	2.25	—
Tire Track Width, Ins.:		12.0	12.0	12.0	—	12.25	12.0	12.0	—
Cone Penetrometer Readings in Track	3"	62	40	45	—	65	40	45	—
	6"	300	300	290	—	300	300	290	—
	9"	05	05	05	—	05	05	05	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
	21"	—	—	—	—	—	—	—	—
	24"	—	—	—	—	—	—	—	—
Cone Penetrometer Readings in Virgin Sand	3"	60	35	38	—	60	34	38	—
	6"	270	270	270	—	260	265	270	—
	9"	05	05	05	—	05	05	05	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
	21"	—	—	—	—	—	—	—	—
	24"	—	—	—	—	—	—	—	—
Plate Penetrometer Readings in Track, psi	3"	48	45	45	—	45	50	50	—
	6"	95	100	100	—	90	110	100	—
	9"	05	05	05	—	05	05	05	—
Plate Penetrometer Readings in Virgin Sand, psi	3"	39	39	40	—	40	41	44	—
	6"	80	85	85	—	80	87	90	—
	9"	05	05	05	—	05	05	05	—

Run Number:	1	2	3	4
Test Vehicle Attitude at Stall, % - Front Up:	—	—	—	—
Front Down:	0	0	0	—

Tire Hop Frequency, Hz 0

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

Figures 15 through 22

Dry Sand Course Grid Profiles

Nevada Automotive Test Center

Project: 20-17-30

COURSE GRID CONE INDEX

DRY SAND

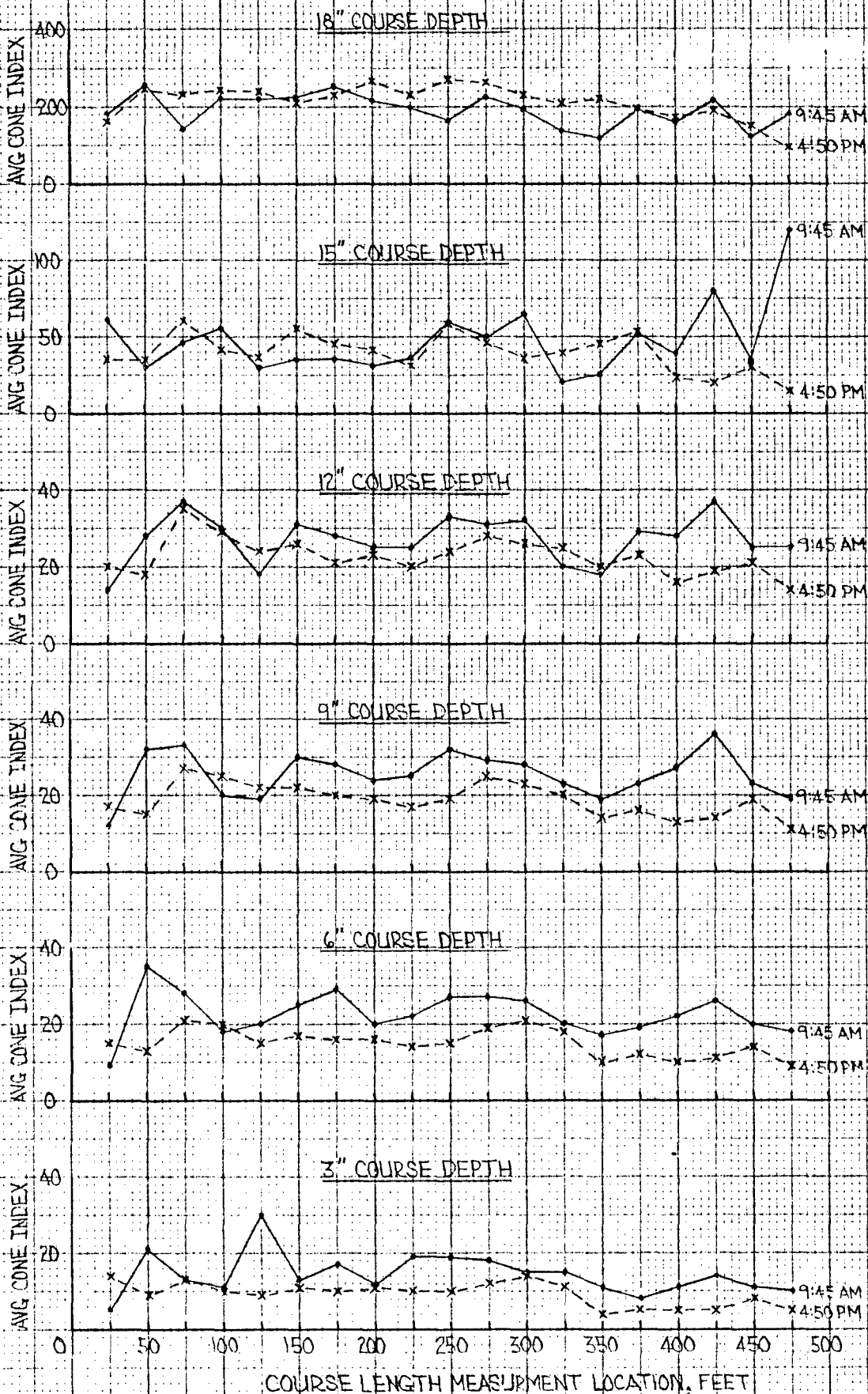
FIGURE NO. 15

Location: SAND MOUNTAIN, NEVADA

Date: 9-19-73

Test By: JED

Data By: WHS



Nevada Automotive Test Center

Project: 20-17-30

COURSE GRID PSI COMPACTION

DRY SAND

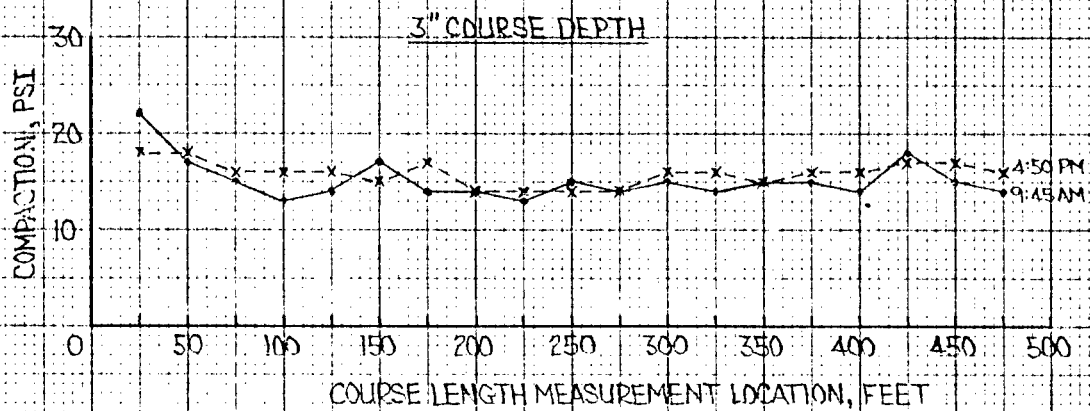
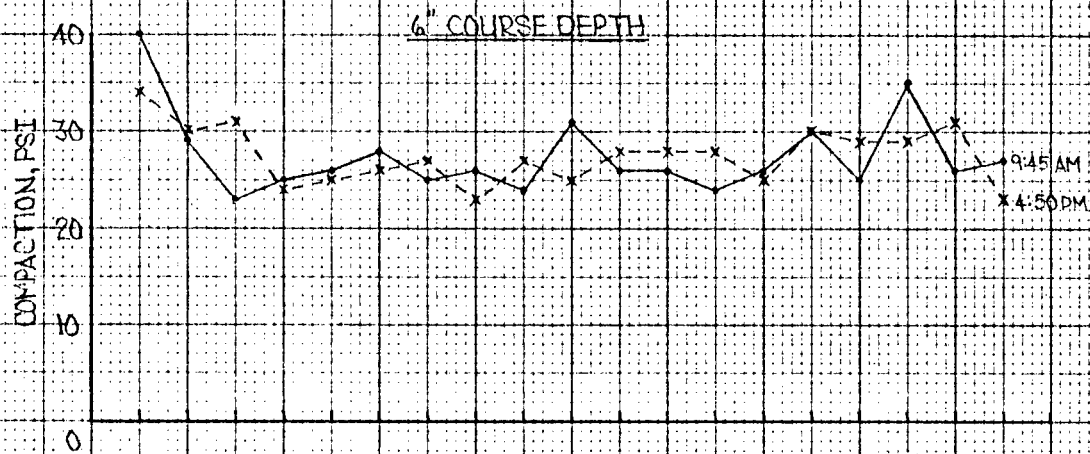
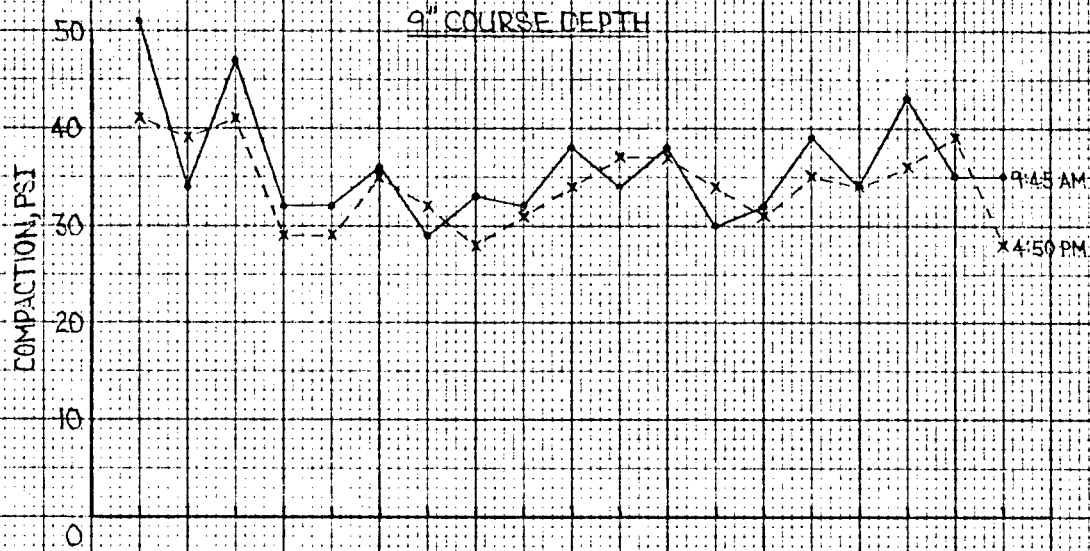
FIGURE NO. 16

Location: SAND MOUNTAIN, NEVADA

Date: 9-19-73

Test By: JED

Data By: WWS



Nevada Automotive Test Center

Project: 20-17-30

COURSE GRID: PSI COMPACTION

DRY SAND

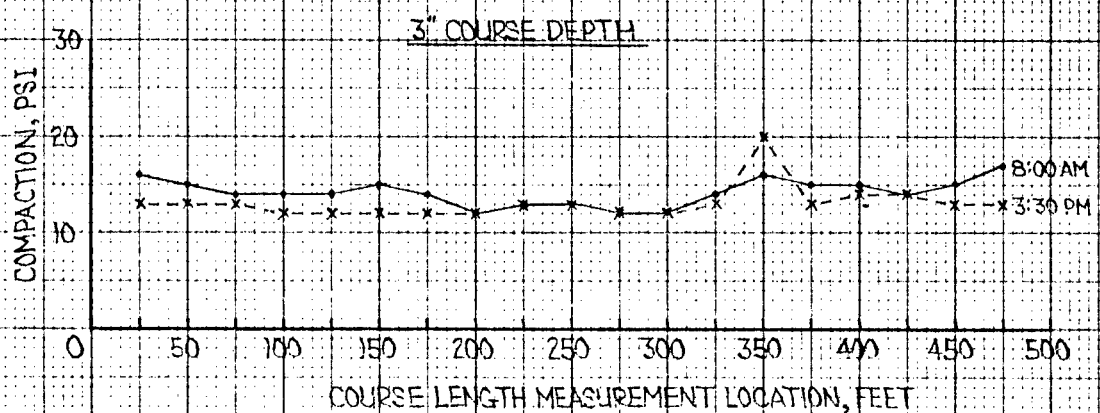
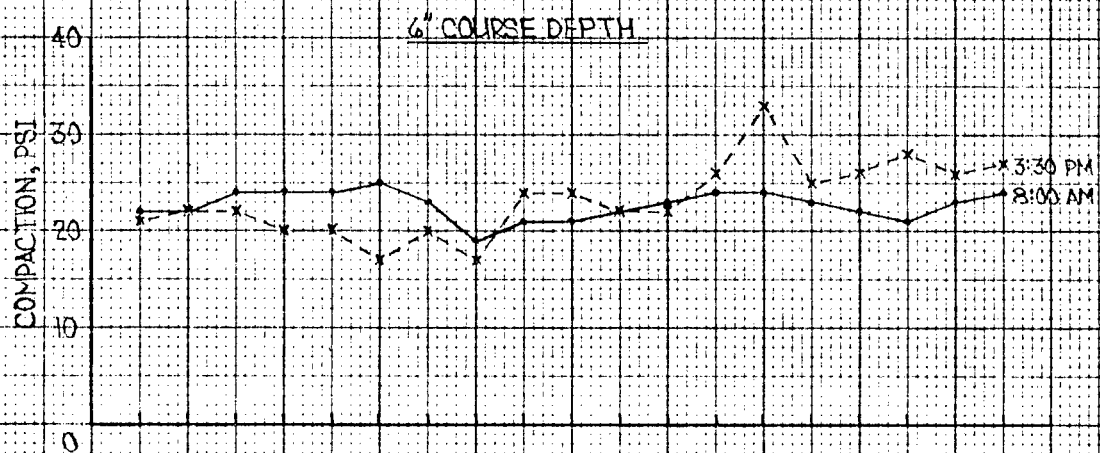
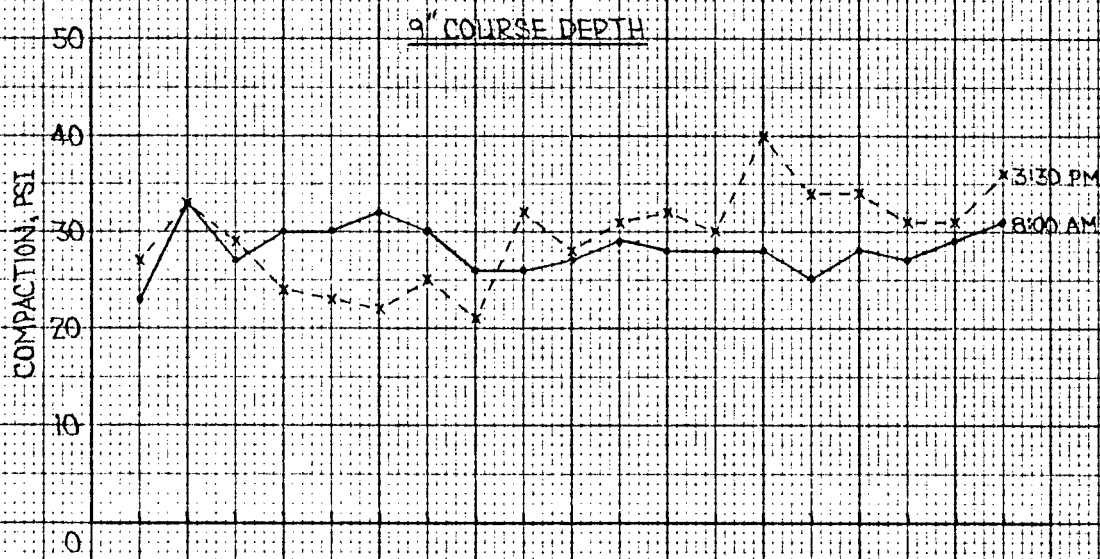
FIGURE NO. 17

Location: SAND MOUNTAIN, NEVADA

Date: 9-20-73

Test By: JED

Data By: WHS



Nevada Automotive Test Center

Project: 20-17-30

COURSE GRID: CONE INDEX

DRY SAND

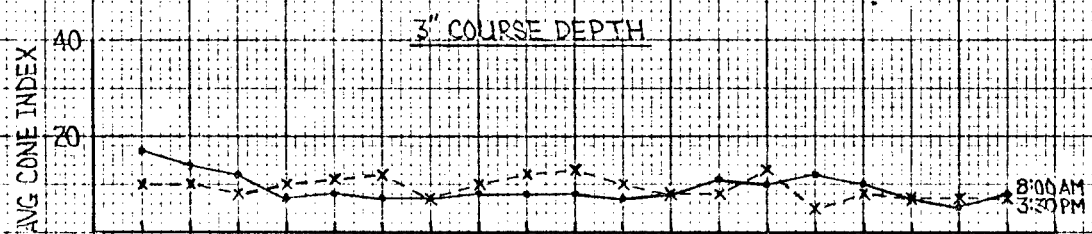
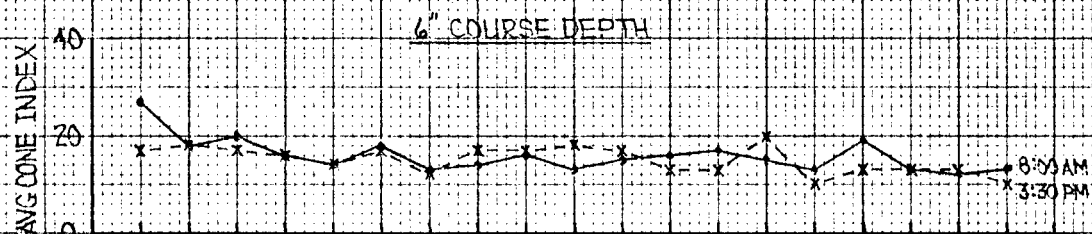
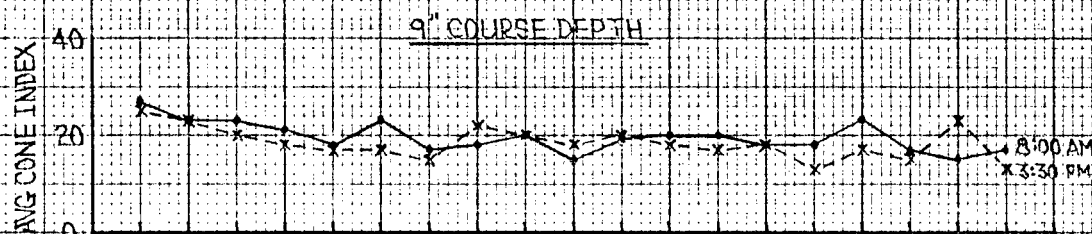
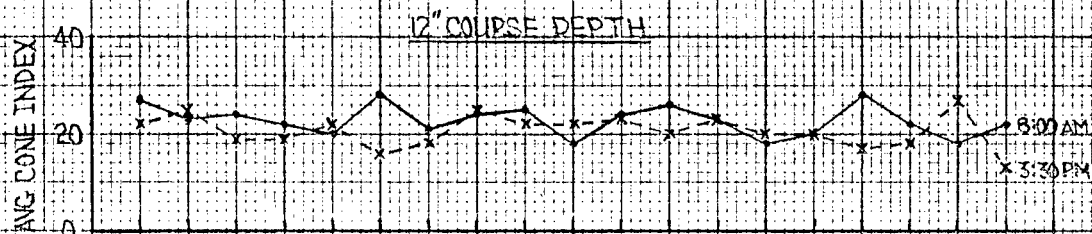
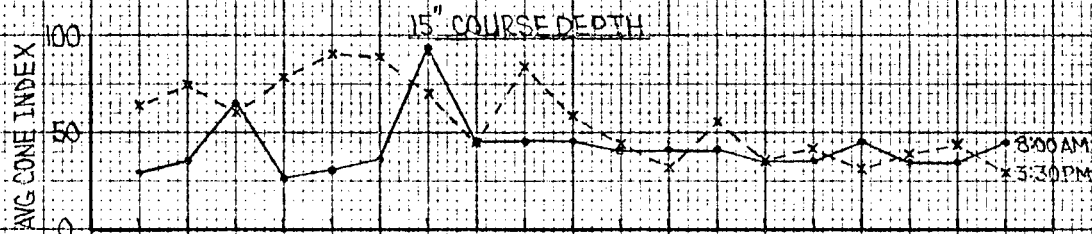
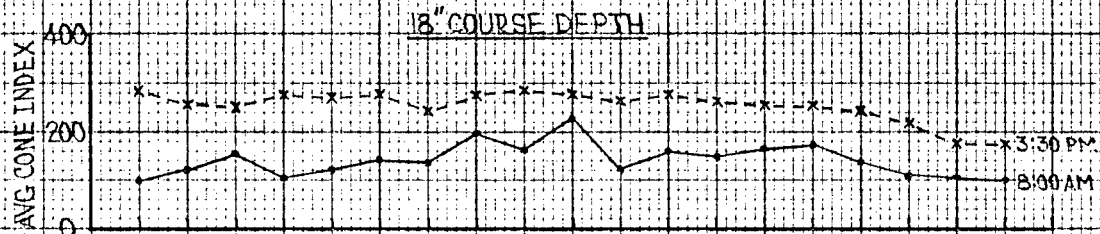
FIGURE NO. 18

Location: SAND MOUNTAIN, NEVADA

Date: 9-20-73

Test By: JED

Data By: WMS



COURSE LENGTH MEASUREMENT LOCATION, FEET

Nevada Automotive Test Center

Project: 20-17-30

COURSE GRID PSI COMPACTION

DRY SAND

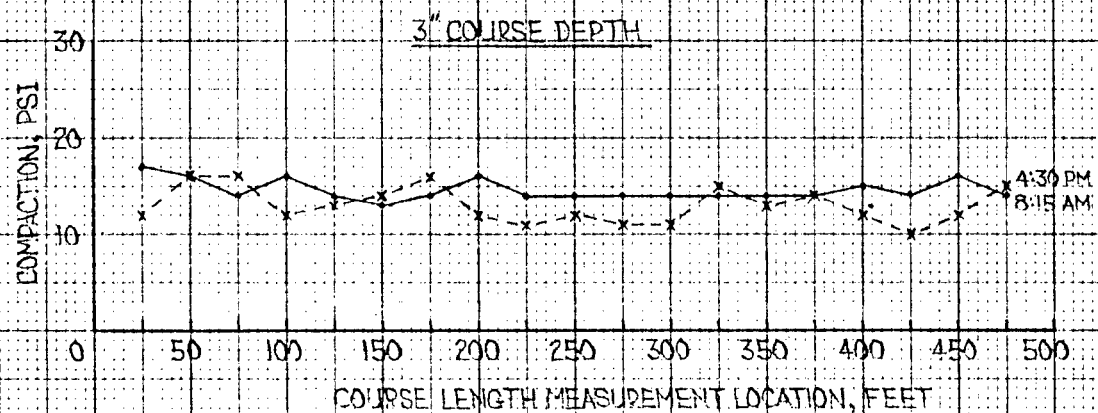
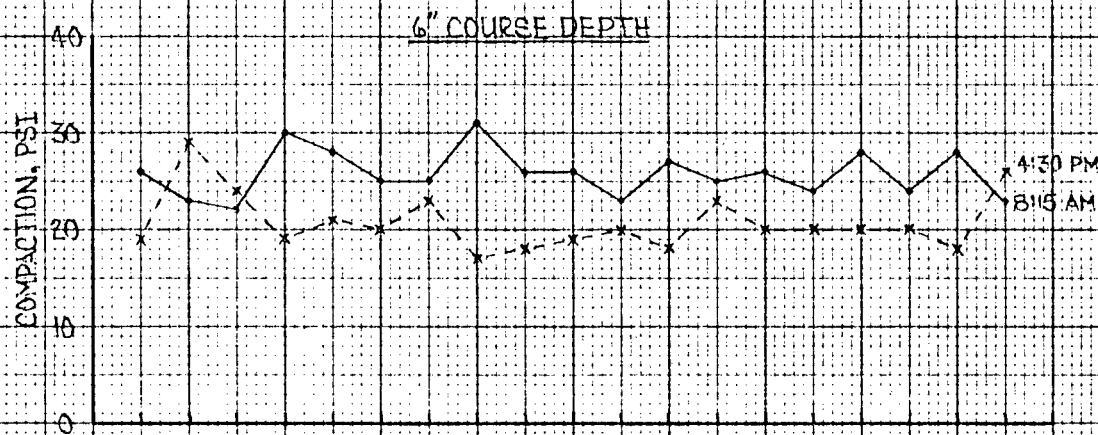
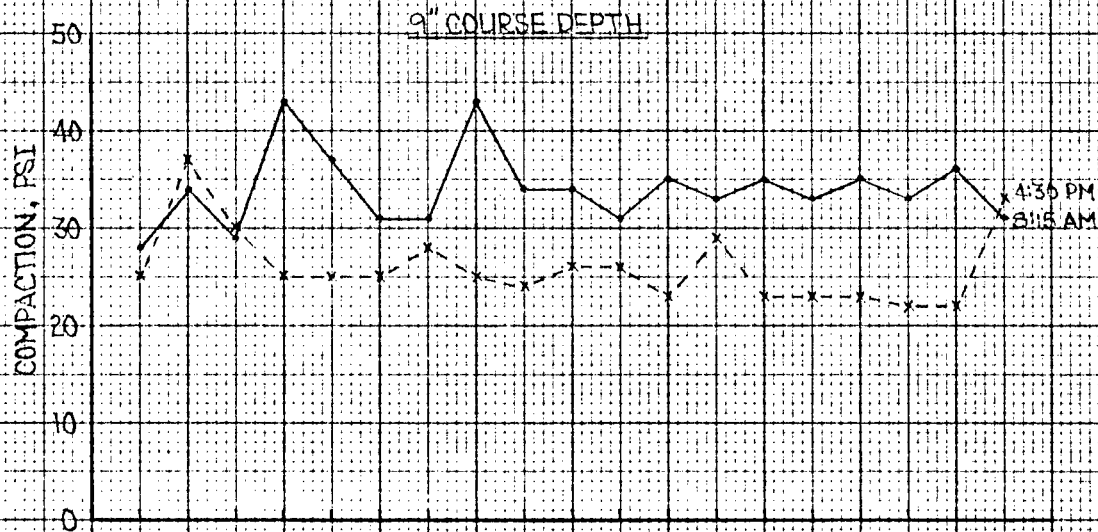
FIGURE NO. 19

Location: SAND MOUNTAIN, NEVADA

Date: 9-21-73

Test By: JED

Data By: WWS



Nevada Automotive Test Center

Project: 20-17-30

COURSE GRID CONE INDEX

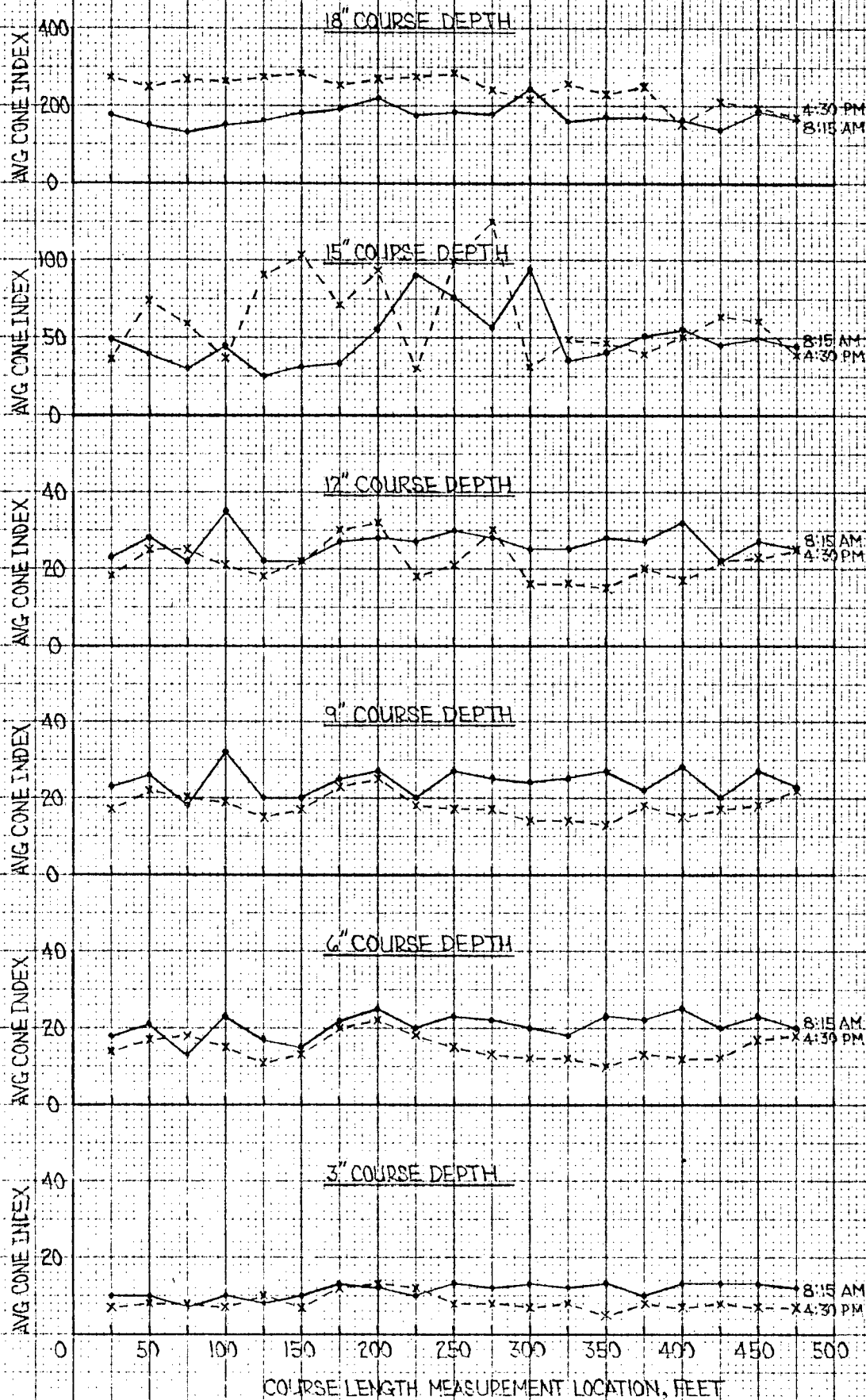
DRY SAND
FIGURE NO. 20

Location: SAND MOUNTAIN, NEVADA

Date: 9-21-73

Test By: JED

Data By: WBS



Nevada Automotive Test Center

Project: 20-17-30

COURSE GRID CONE INDEX

DRY SAND

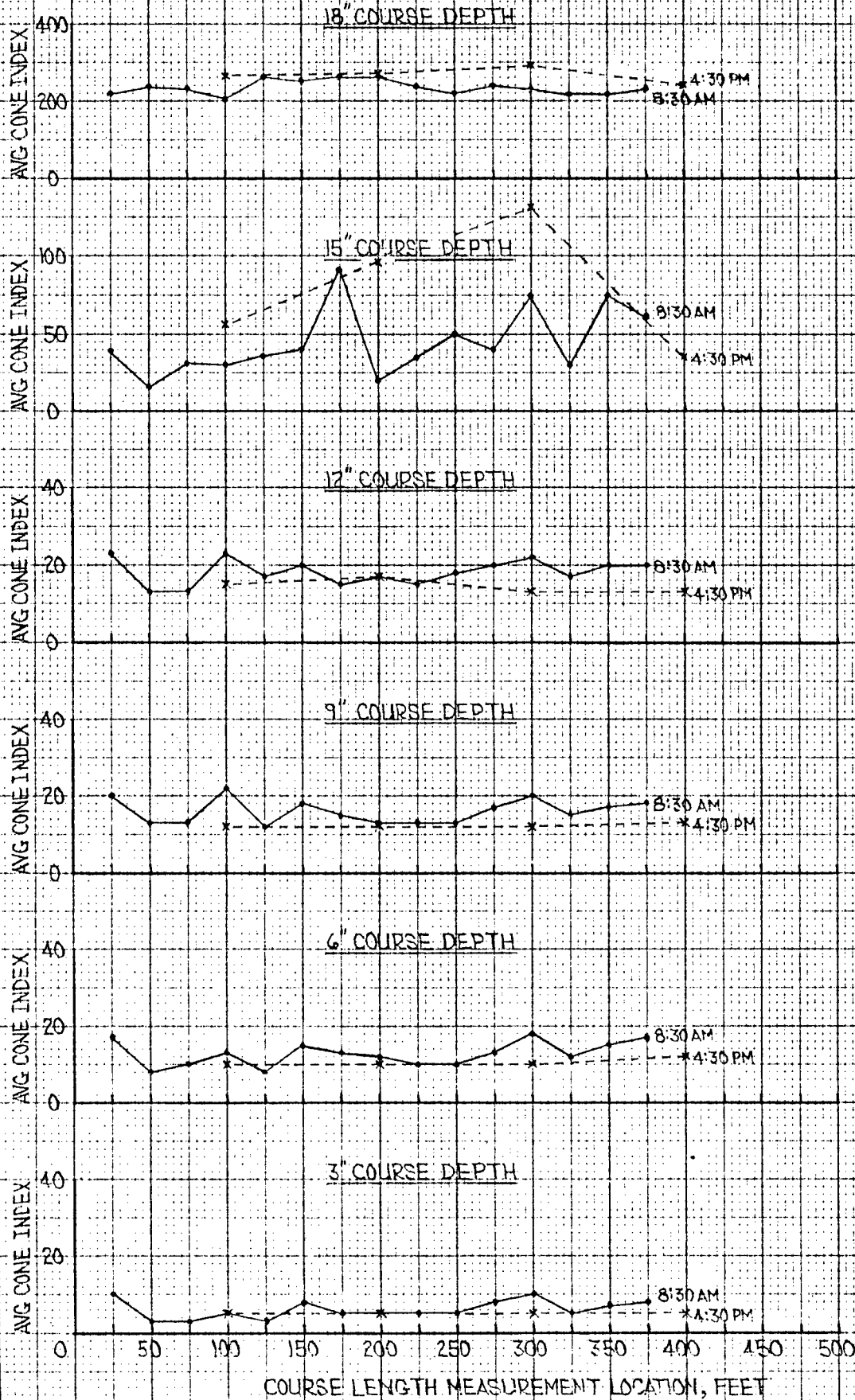
FIGURE NO. 21

Location: SAND MOUNTAIN, NEVADA

Date: 9-26-73

Test By: JED

Data By: WHS



Nevada Automotive Test Center

Project: 20-17-30

COURSE GRID PSI COMPACTION

DRY SAND

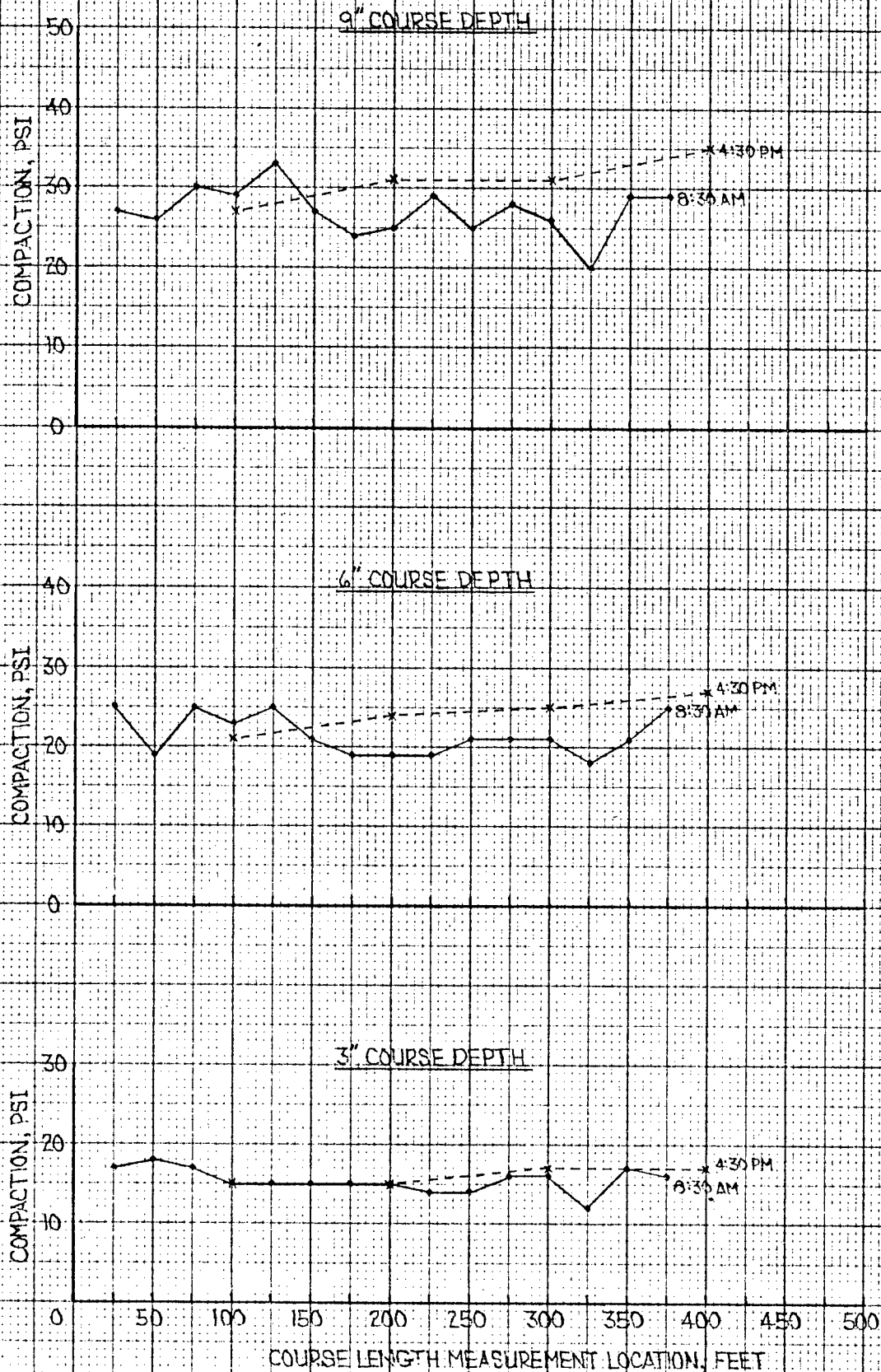
FIGURE NO. 22

Location: SAND MOUNTAIN, NEVADA

Date: 9-26-73

Test By: JED

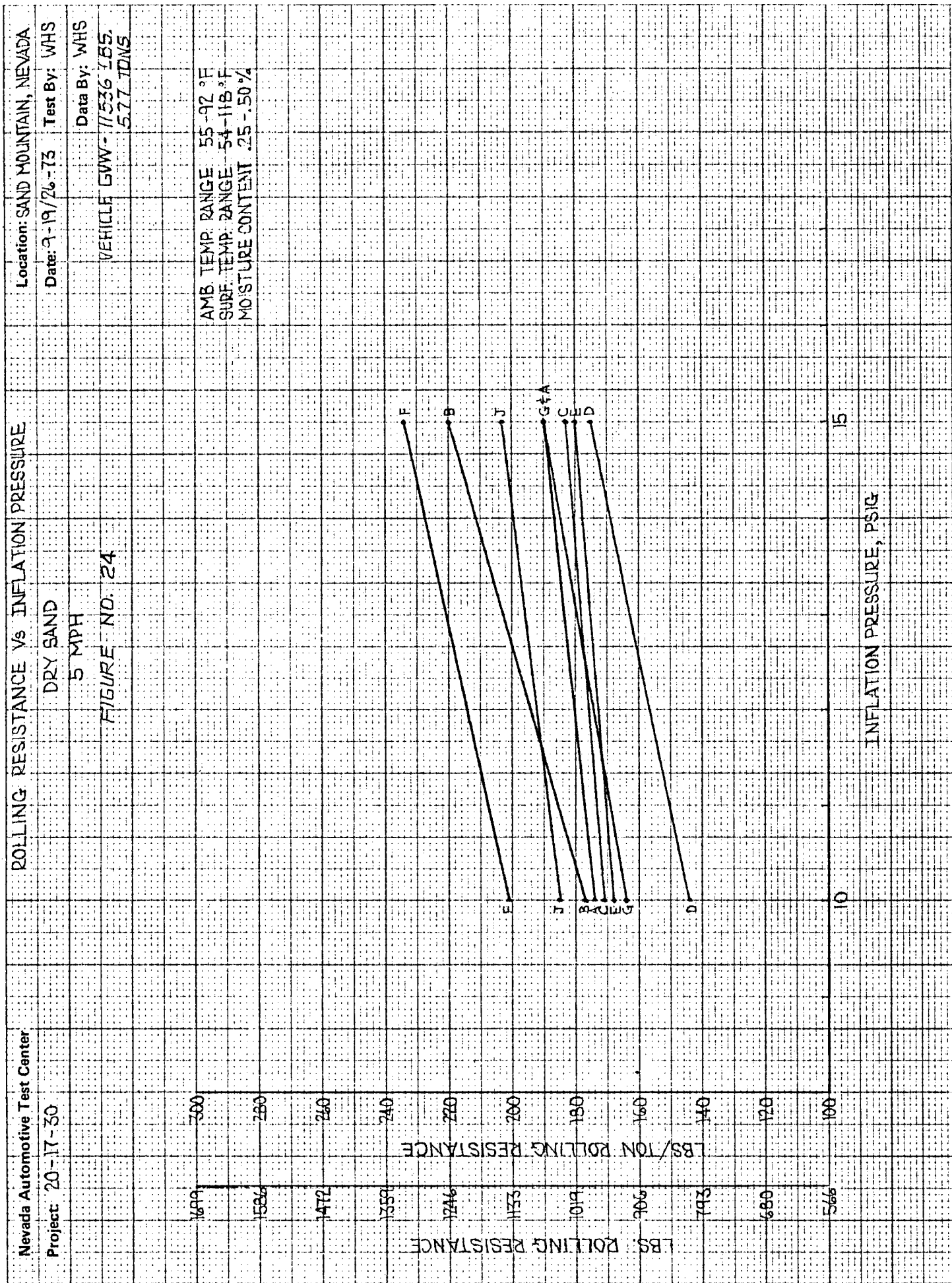
Data By: WHS



TEST DATA

Figures No. 23 & 24

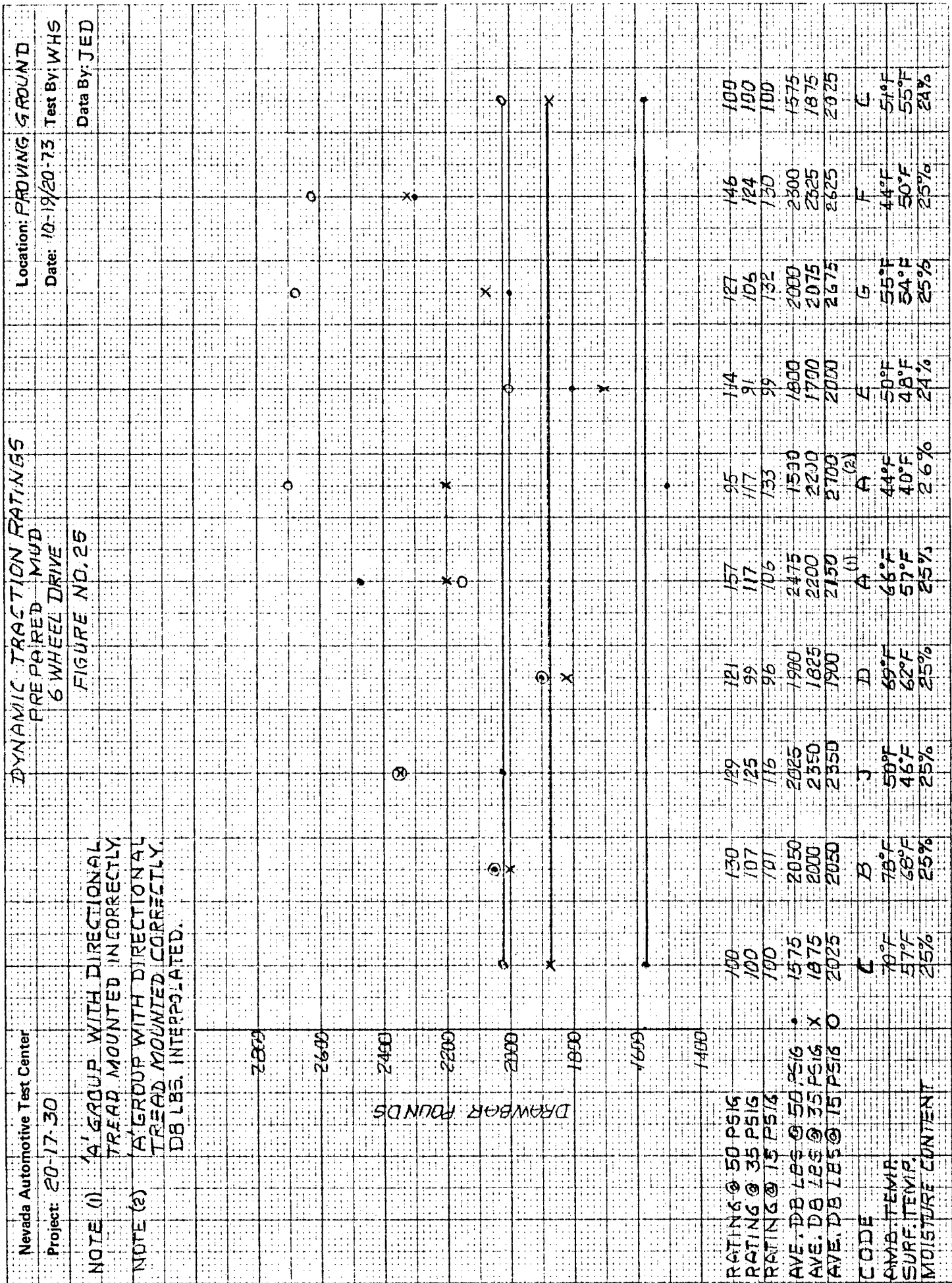
Rolling Resistance - Dry Sand



TEST DATA

Figure No. 25

Dynamic Traction Summary - Prepared Mud



TEST DATA

Figures 26 through 34

Dynamic Traction - Prepared Mud

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

MUD

GRAPHIC FORM NO. 1

6 WHEEL DRIVE

FIGURE NO. 26

Location: PROVING GROUND

Date: 10-19-73

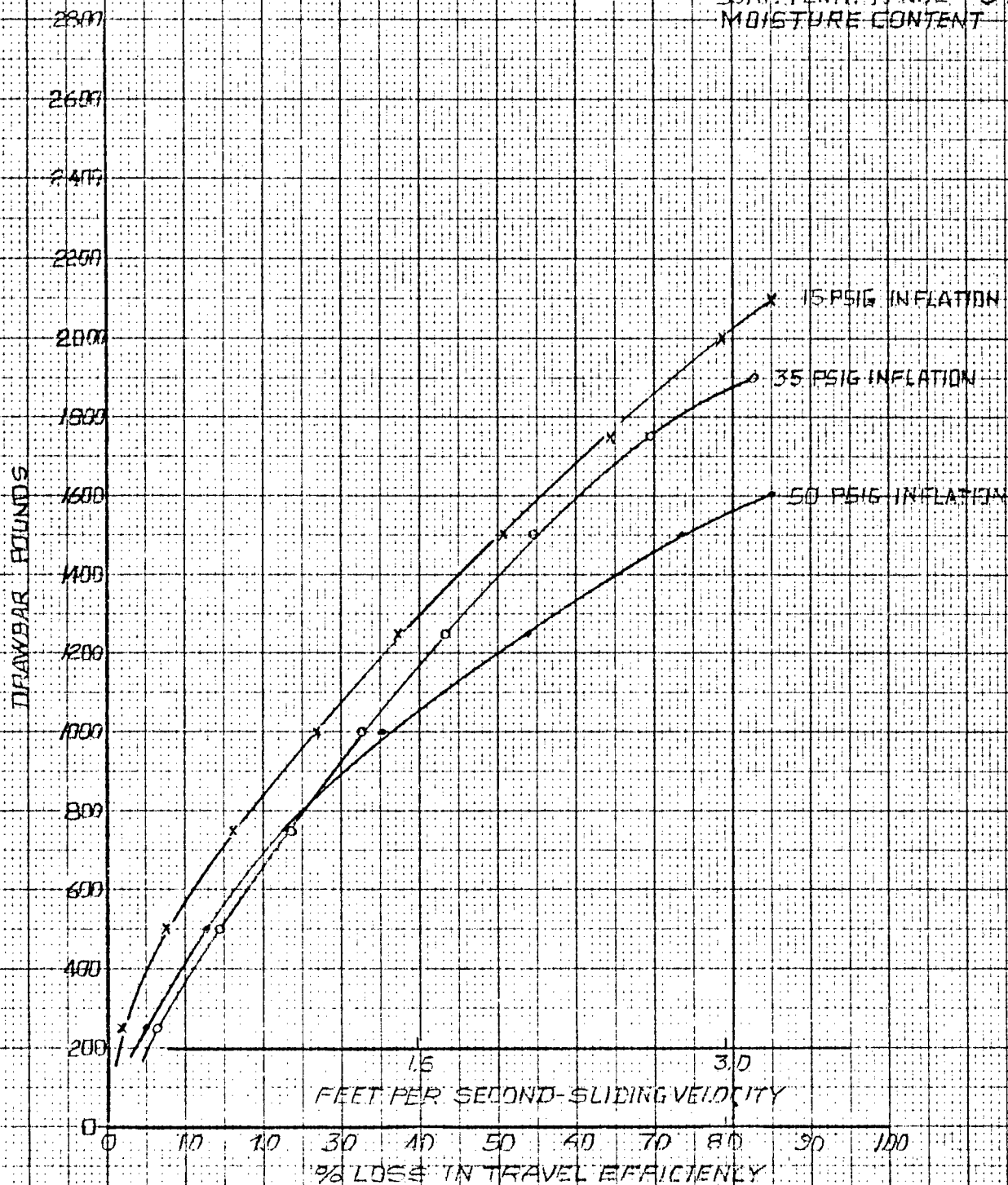
Test By: WHS

Data By: WHS

AIR TEMP RANGE 70°F

SURF TEMP RANGE 57°F

MOISTURE CONTENT 25%



TEST DATA

Date: 10-19-73 Time: 11:15 AM Test Vehicle: 1134 6x6
 Vehicle Weight, Truck: 11526 LBS Trailer: NA Tire Group: C
 Inflation, psig: 50 Ambient Temp. °F.: 66 Surface Temp. °F.: 56
 Relative Humidity %: 22 Wind Speed, mph: 0-6 Wind Direction: E

Sample Depth, Inches

3	9	18
—	—	—

Mud Moisture Content, %: 25.3

		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Run Number:									
Tire Track Depth, Ins.:		<u>8 1/2</u>	<u>8</u>	<u>8 3/8</u>	<u>—</u>	<u>7 1/2</u>	<u>8 3/8</u>	<u>8 3/8</u>	<u>—</u>
Tire Track Width, Ins.:		<u>7</u>	<u>8 1/4</u>	<u>7 3/4</u>	<u>—</u>	<u>8</u>	<u>8</u>	<u>7 1/2</u>	<u>—</u>
Cone Penetrometer	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Readings in Track	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Cone Penetrometer	3"	<u>2</u>	<u>5</u>	<u>5</u>	<u>—</u>	<u>2</u>	<u>5</u>	<u>5</u>	<u>—</u>
Readings in	6"	<u>10</u>	<u>10</u>	<u>10</u>	<u>—</u>	<u>15</u>	<u>10</u>	<u>10</u>	<u>—</u>
Mud, psi	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Readings in Track,	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
psi	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer	3"	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>
Readings in	6"	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>
Mud, psi	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Comments: _____

TEST DATA

Date: 10-73 Time: 11:25 AM Test Vehicle: M34 6x6
 Vehicle Weight, Truck: 11536 Trailer: N/A Tire Group: C
 Inflation, psig: 35 Ambient Temp. °F.: 75 Surface Temp. °F.: 58
 Relative Humidity %: 22 Wind Speed, mph: 0-6 Wind Direction: E

Sample Depth, Inches:

Mud Moisture Content, %: 25.3

3	9	18
-	-	-

Run Number:	Left Rear				Right Rear			
	1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:	<u>7 5/8</u>	<u>9</u>	-	-	<u>7 1/4</u>	<u>8 1/8</u>	-	-
Tire Track Width, Ins.:	<u>7</u>	<u>7 1/4</u>	-	-	<u>8 1/2</u>	<u>6 3/4</u>	-	-
Cone Penetrometer 3"	-	-	-	-	-	-	-	-
Readings in Track 6"	-	-	-	-	-	-	-	-
9"	-	-	-	-	-	-	-	-
12"	-	-	-	-	-	-	-	-
15"	-	-	-	-	-	-	-	-
18"	-	-	-	-	-	-	-	-
21"	-	-	-	-	-	-	-	-
24"	-	-	-	-	-	-	-	-
Cone Penetrometer 3"	<u>4</u>	<u>5</u>	-	-	<u>5</u>	<u>5</u>	-	-
Readings in 6"	<u>10</u>	<u>10</u>	-	-	<u>15</u>	<u>15</u>	-	-
Mud, psi 9"	-	-	-	-	-	-	-	-
12"	-	-	-	-	-	-	-	-
15"	-	-	-	-	-	-	-	-
18"	-	-	-	-	-	-	-	-
21"	-	-	-	-	-	-	-	-
24"	-	-	-	-	-	-	-	-
Plate Penetrometer 3"	-	-	-	-	-	-	-	-
Readings in Track, 6"	-	-	-	-	-	-	-	-
psi 9"	-	-	-	-	-	-	-	-
Plate Penetrometer 3"	<u>0</u>	<u>0</u>	-	-	<u>0</u>	<u>0</u>	-	-
Readings in 6"	<u>0</u>	<u>0</u>	-	-	<u>0</u>	<u>0</u>	-	-
Mud, psi 9"	-	-	-	-	-	-	-	-

Comments: _____

TEST DATA

Date: 10-19-73 Time: 12:55PM Test Vehicle: 1 34 6x6
 Vehicle Weight, Truck: 11536 LBS Trailer: 1164 Tire Group: C
 Inflation, psig: 15 Ambient Temp. °F.: 78 Surface Temp. °F.: 67
 Relative Humidity %: 25 Wind Speed, mph: 0-5 Wind Direction: W

Sample Depth, Inches

Mud Moisture Content, %: 25.3

3 9 18
— — —

Run Number:	Left Rear				Right Rear			
	1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:	<u>7³/₄</u>	<u>9</u>	<u>—</u>	<u>—</u>	<u>7</u>	<u>7¹/₄</u>	<u>—</u>	<u>—</u>
Tire Track Width, Ins.:	<u>8¹/₂</u>	<u>7</u>	<u>—</u>	<u>—</u>	<u>8¹/₂</u>	<u>9</u>	<u>—</u>	<u>—</u>
Cone Penetrometer 3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Readings in Track 6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Cone Penetrometer 3"	<u>5</u>	<u>4</u>	<u>—</u>	<u>—</u>	<u>2</u>	<u>2</u>	<u>—</u>	<u>—</u>
Readings in 6"	<u>10</u>	<u>10</u>	<u>—</u>	<u>—</u>	<u>5</u>	<u>5</u>	<u>—</u>	<u>—</u>
Mud, psi 9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer 3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Readings in Track, 6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
psi 9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer 3"	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>
Readings in 6"	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>
Mud, psi 9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

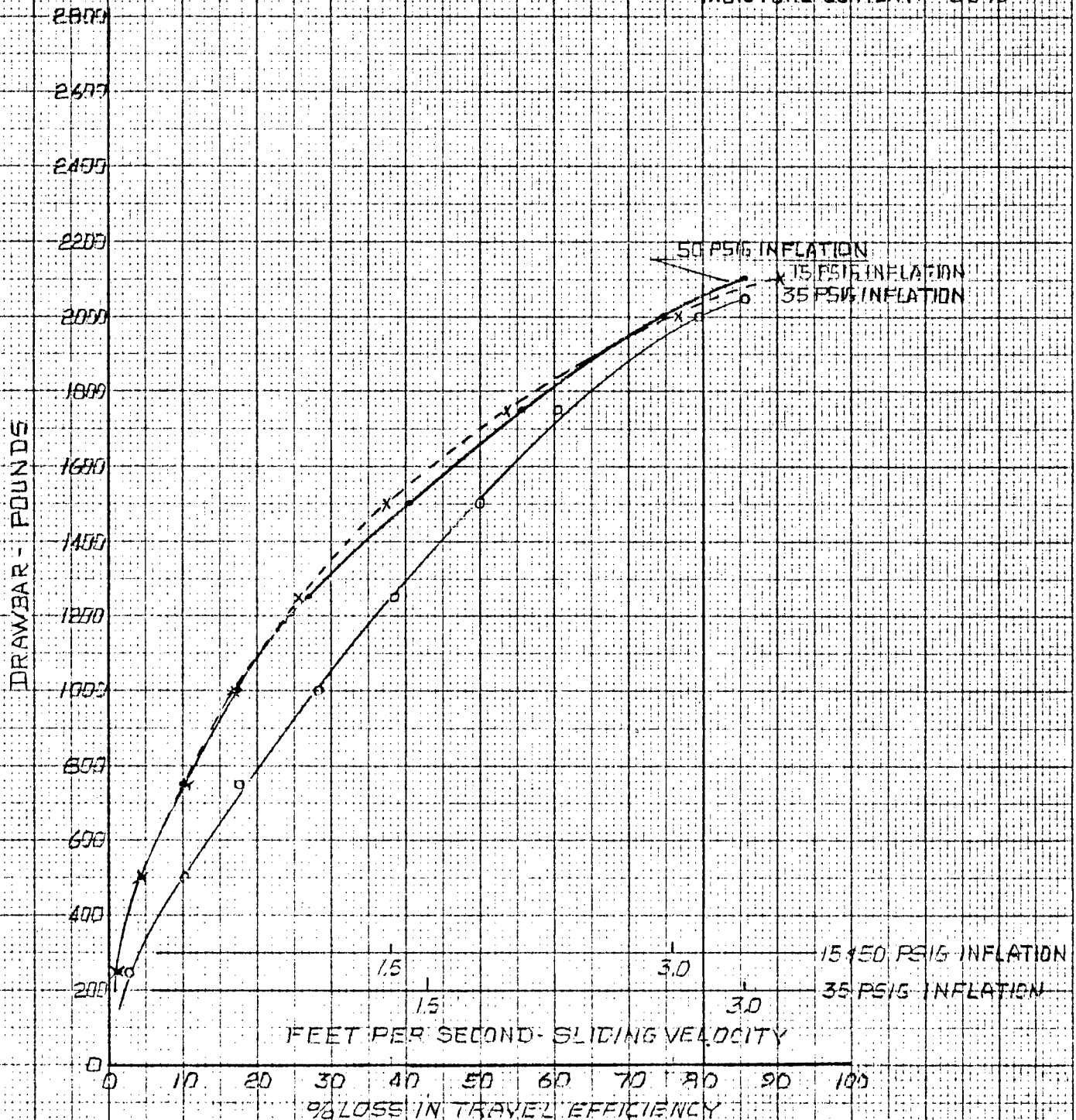
DYNAMIC TRACTION
MUD
GROUP: B RUN NO. 2
6 WHEEL DRIVE
FIGURE NO. 27

Location: PROVING GROUND

Date: 10-19-73 Test By: WHS

Data By: WHS

AMB. TEMP: 78°F
SURF. TEMP: 68°F
MOISTURE CONTENT: 25%



TEST DATA

Date: 10-19-73 Time: 2:12 PM Test Vehicle: 1474 6x6

Vehicle Weight, Truck: 11536 LRS Trailer: 110 Tire Group: B

Inflation, psig: 50 Ambient Temp. °F.: 78 Surface Temp. °F.: 68

Relative Humidity %: 26 Wind Speed, mph: 0-8 Wind Direction: W

Sample Depth, Inches		
3	9	18
-	-	-

Mud Moisture Content, %: 24.7

		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Run Number:									
Tire Track Depth, Ins.:		<u>8 1/4</u>	<u>6 1/2</u>	-	-	<u>7 1/2</u>	<u>7 1/2</u>	-	-
Tire Track Width, Ins.:		<u>6 1/2</u>	<u>7 1/2</u>	-	-	<u>8</u>	<u>10</u>	-	-
Cone Penetrometer	3"	-	-	-	-	-	-	-	-
Readings in Track	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Cone Penetrometer	3"	<u>5</u>	<u>5</u>	-	-	<u>5</u>	<u>2</u>	-	-
Readings in	6"	<u>10</u>	<u>10</u>	-	-	<u>5</u>	<u>5</u>	-	-
Mud, psi	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Plate Penetrometer	3"	-	-	-	-	-	-	-	-
Readings in Track,	6"	-	-	-	-	-	-	-	-
psi	9"	-	-	-	-	-	-	-	-
Plate Penetrometer	3"	<u>0</u>	<u>0</u>	-	-	<u>0</u>	<u>0</u>	-	-
Readings in	6"	<u>0</u>	<u>0</u>	-	-	<u>0</u>	<u>0</u>	-	-
Mud, psi	9"	-	-	-	-	-	-	-	-

Comments: _____

TEST DATA

Date: 10-19-73 Time: 3:00 PM Test Vehicle: 1934 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: NO Tire Group: B

Inflation, psig: 35 Ambient Temp. °F.: 73 Surface Temp. °F.: 68

Relative Humidity %: 28 Wind Speed, mph: 0.9 Wind Direction: W

Sample Depth, Inches

3	9	18
-	-	-

Mud Moisture Content, %: 24.7

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>7 1/2</u>	<u>9</u>	-	-	<u>6 3/4</u>	<u>8 5/8</u>	-	-
Tire Track Width, Ins.:		<u>8 1/2</u>	<u>8 1/4</u>	-	-	<u>8</u>	<u>8 5/8</u>	-	-
Cone Penetrometer Readings in Track	3"	-	-	-	-	-	-	-	-
	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Cone Penetrometer Readings in Mud, psi	3"	<u>5</u>	<u>5</u>	-	-	<u>5</u>	<u>5</u>	-	-
	6"	<u>10</u>	<u>10</u>	-	-	<u>10</u>	<u>10</u>	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Track, psi	3"	-	-	-	-	-	-	-	-
	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Mud, psi	3"	<u>0</u>	<u>0</u>	-	-	<u>0</u>	<u>0</u>	-	-
	6"	<u>0</u>	<u>0</u>	-	-	<u>0</u>	<u>0</u>	-	-
	9"	-	-	-	-	-	-	-	-

Comments: _____

TEST DATA

Date: 10 18 73 Time: 3:25 PM Test Vehicle: 1134 6x6
 Vehicle Weight, Truck: 11536 LBS Trailer: 11A Tire Group: B
 Inflation, psig: 15 Ambient Temp. °F.: 77 Surface Temp. °F.: 68
 Relative Humidity %: 25 Wind Speed, mph: 0.7 Wind Direction: W

Sample Depth, Inches

3	9	18
—	—	—

Mud Moisture Content, %: 24.7

		Left Rear				Right Rear			
Run Number:		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>8 1/8</u>	<u>8</u>	<u>-</u>	<u>-</u>	<u>8 3/8</u>	<u>7</u>	<u>-</u>	<u>-</u>
Tire Track Width, Ins.:		<u>7</u>	<u>7 3/4</u>	<u>-</u>	<u>-</u>	<u>6 3/4</u>	<u>8</u>	<u>-</u>	<u>-</u>
Cone Penetrometer	3"								
Readings in Track	6"								
	9"								
	12"								
	15"								
	18"								
	21"								
	24"								
Cone Penetrometer	3"	<u>5</u>	<u>4</u>	<u>-</u>	<u>-</u>	<u>2</u>	<u>2</u>	<u>-</u>	<u>-</u>
Readings in	6"	<u>10</u>	<u>10</u>	<u>-</u>	<u>-</u>	<u>10</u>	<u>10</u>	<u>-</u>	<u>-</u>
Mud, psi	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	12"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	15"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer	3"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Readings in Track,	6"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
psi	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer	3"	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>
Readings in	6"	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>
Mud, psi	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
MUD
GROUP J RUN NO. 3
6 WHEEL DRIVE
FIGURE NO. 28

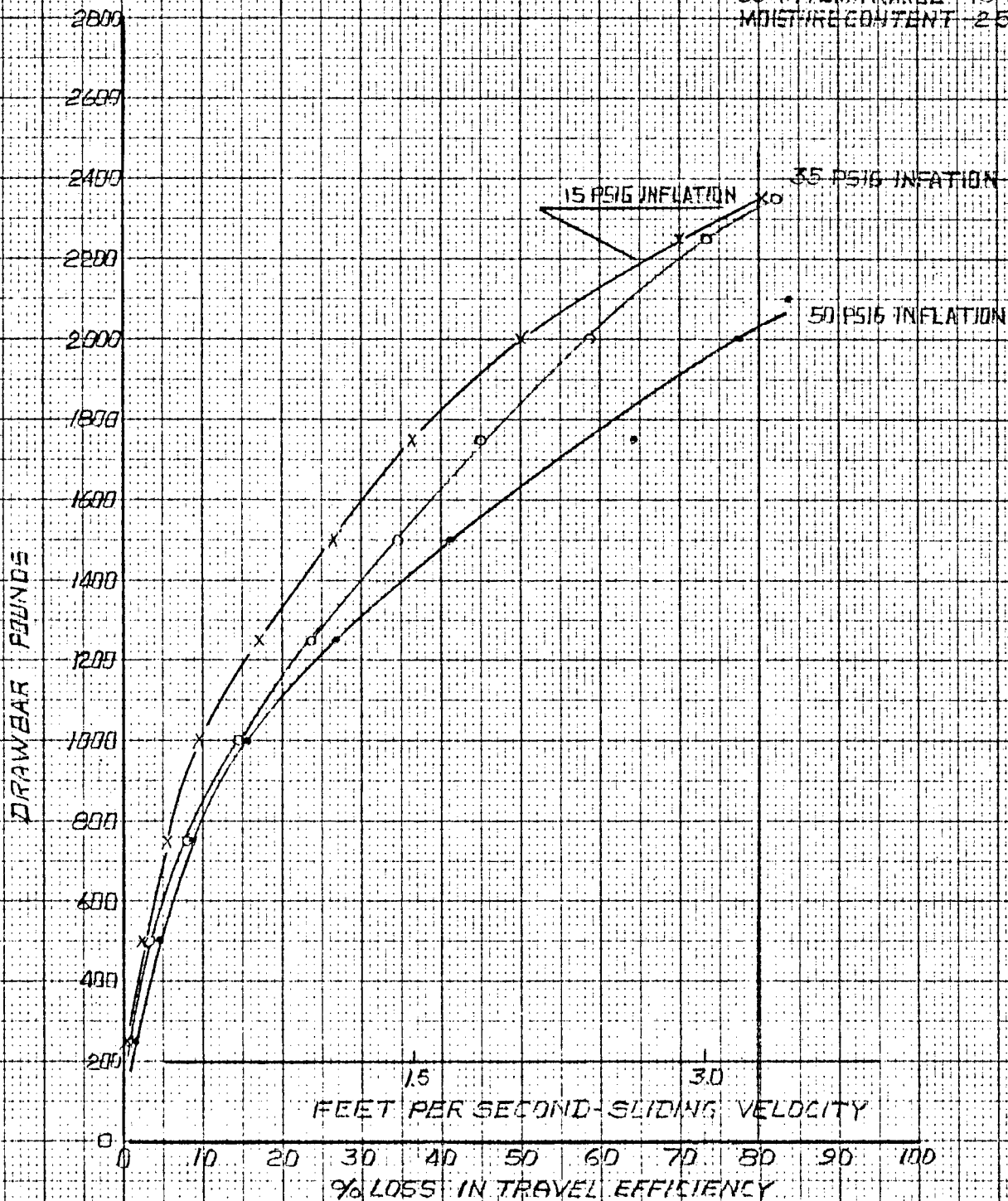
Location: PROVING GROUND

Date: 10-22-73

Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 50°F
SURF. TEMP. RANGE 46°F
MOISTURE CONTENT 25%



TEST DATA

Date: 10-22-73 Time: 9:55 AM Test Vehicle: M34 6x6
 Vehicle Weight, Truck: 11,536 LBS Trailer: 11A Tire Group: J
 Inflation, psig: 50 Ambient Temp. °F.: 44 Surface Temp. °F.: 40
 Relative Humidity %: 41 Wind Speed, mph: 0 Wind Direction: -

Sample Depth, Inches

Mud Moisture Content, %: 25.1

3	9	18
-	-	-

		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Run Number:									
Tire Track Depth, Ins.:		<u>7 ³/₄</u>	<u>8 ¹/₄</u>	-	-	<u>6 ¹/₂</u>	<u>8 ³/₄</u>	-	-
Tire Track Width, Ins.:		<u>11</u>	<u>9</u>	-	-	<u>10 ³/₄</u>	<u>8 ¹/₂</u>	-	-
Cone Penetrometer	3"	-	-	-	-	-	-	-	-
Readings in Track	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Cone Penetrometer	3"	<u>2</u>	<u>5</u>	-	-	<u>2</u>	<u>5</u>	-	-
Readings in	6"	<u>10</u>	<u>10</u>	-	-	<u>10</u>	<u>10</u>	-	-
Mud, psi	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Plate Penetrometer	3"	-	-	-	-	-	-	-	-
Readings in Track,	6"	-	-	-	-	-	-	-	-
psi	9"	-	-	-	-	-	-	-	-
Plate Penetrometer	3"	<u>0</u>	<u>0</u>	-	-	<u>0</u>	<u>0</u>	-	-
Readings in	6"	<u>0</u>	<u>0</u>	-	-	<u>0</u>	<u>0</u>	-	-
Mud, psi	9"	-	-	-	-	-	-	-	-

Comments: _____

TEST DATA

Date: 10 22 73 Time: 10:15 Test Vehicle: M 34 6x6

Vehicle Weight, Truck: 11,536 LBS Trailer: 11A Tire Group: J

Inflation, psig: 35 Ambient Temp. °F.: 50 Surface Temp. °F.: 46

Relative Humidity %: 40 Wind Speed, mph: 0 Wind Direction: -

Mud Moisture Content, %: 25.1

Sample Depth, Inches

3	9	18
<u>-</u>	<u>-</u>	<u>-</u>

		Left Rear				Right Rear			
Run Number:		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>8 1/4</u>	<u>7 3/4</u>	<u>7</u>	<u>-</u>	<u>8</u>	<u>8 5/8</u>	<u>7 3/4</u>	<u>-</u>
Tire Track Width, Ins.:		<u>8</u>	<u>8 1/4</u>	<u>8 1/4</u>	<u>-</u>	<u>7 3/4</u>	<u>9</u>	<u>8 1/2</u>	<u>-</u>
Cone Penetrometer Readings in Track	3"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	6"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	12"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	15"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Mud, psi	3"	<u>4</u>	<u>5</u>	<u>5</u>	<u>-</u>	<u>5</u>	<u>5</u>	<u>5</u>	<u>-</u>
	6"	<u>15</u>	<u>15</u>	<u>15</u>	<u>-</u>	<u>15</u>	<u>10</u>	<u>15</u>	<u>-</u>
	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	12"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	15"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	3"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	6"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Mud, psi	3"	<u>0</u>	<u>0</u>	<u>0</u>	<u>-</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>-</u>
	6"	<u>0</u>	<u>0</u>	<u>0</u>	<u>-</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>-</u>
	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

Comments: _____

TEST DATA

Date: 10-20-73 Time: 10:45AM Test Vehicle: M34 6x6
 Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: J
 Inflation, psig: 15 Ambient Temp. °F.: 51 Surface Temp. °F.: 47
 Relative Humidity %: 40 Wind Speed, mph: 2-7 Wind Direction: N

Sample Depth, Inches:

3	9	18
—	—	—

Mud Moisture Content, %: 25.1

		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Run Number:									
Tire Track Depth, Ins.:		<u>6 1/2</u>	<u>7 3/4</u>	<u>—</u>	<u>—</u>	<u>7</u>	<u>8 1/2</u>	<u>—</u>	<u>—</u>
Tire Track Width, Ins.:		<u>8 1/4</u>	<u>8</u>	<u>—</u>	<u>—</u>	<u>7 3/4</u>	<u>8</u>	<u>—</u>	<u>—</u>
Cone Penetrometer	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Readings in Track	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Cone Penetrometer	3"	<u>5</u>	<u>5</u>	<u>—</u>	<u>—</u>	<u>5</u>	<u>2</u>	<u>—</u>	<u>—</u>
Readings in	6"	<u>5</u>	<u>5</u>	<u>—</u>	<u>—</u>	<u>5</u>	<u>5</u>	<u>—</u>	<u>—</u>
Mud, psi	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Readings in Track,	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
psi	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Readings in	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Mud, psi	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

MUD

GROUND RUN NO. 4

6 WHEEL DRIVE

FIGURE NO. 29

Location: SAND MOUNTAIN, NEV.

Date: 10-22-73

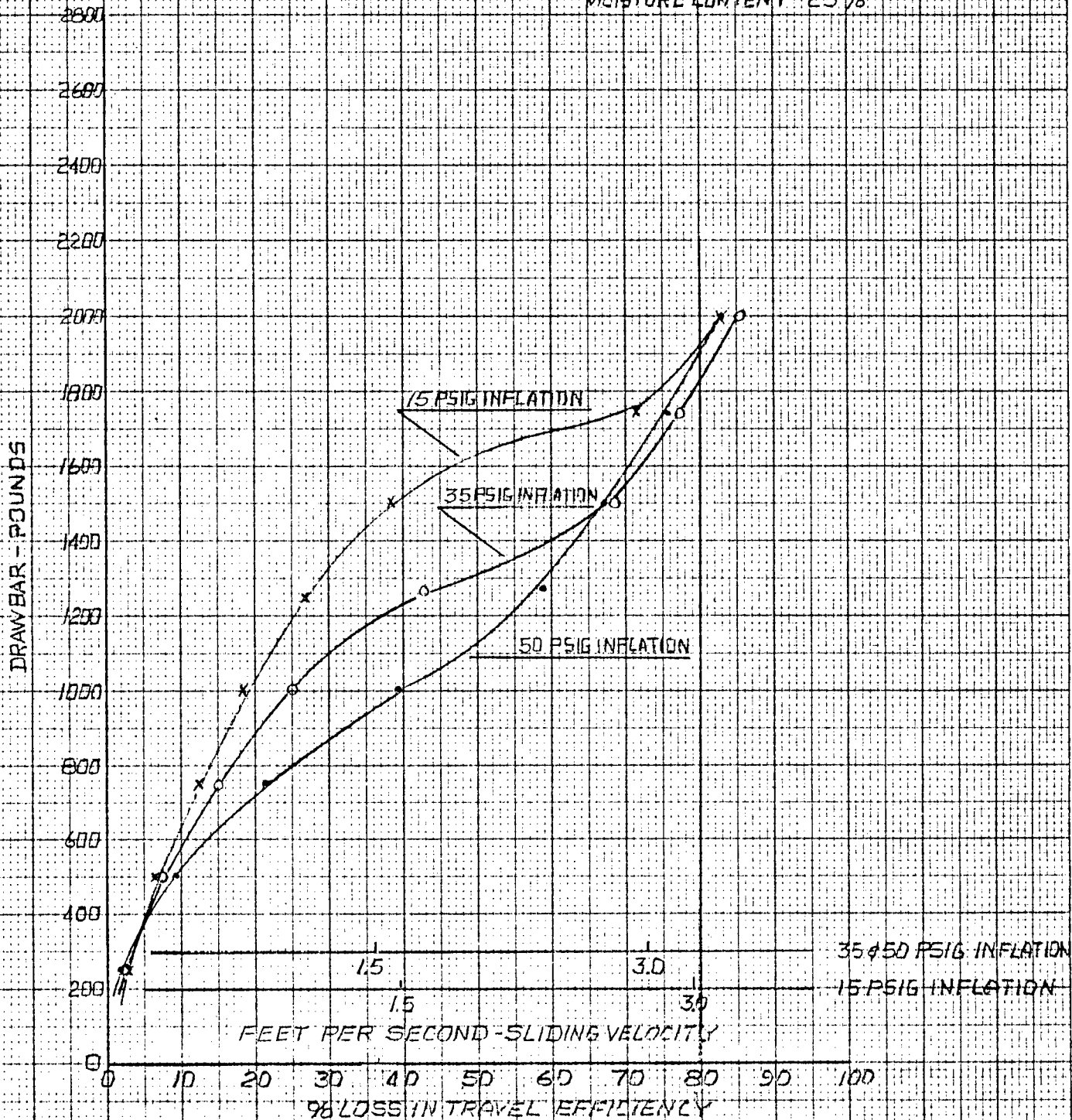
Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 69°F

SURF. TEMP. RANGE 62°F

MOISTURE CONTENT 25%



TEST DATA

Date: 10-22-73 Time: 12:20 PM Test Vehicle: M34 6x6
 Vehicle Weight, Truck: 11536 LBS Trailer: NA Tire Group: D
 Inflation, psig: 50 Ambient Temp. °F.: 68 Surface Temp. °F.: 61
 Relative Humidity %: 31 Wind Speed, mph: 2-3 Wind Direction: N

Sample Depth, Inches

3	9	18
—	—	—

Mud Moisture Content, %: 25.7

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>8</u>	<u>7 1/3</u>	<u>5 1/3</u>	<u>—</u>	<u>8</u>	<u>8</u>	<u>6 3/4</u>	<u>—</u>
Tire Track Width, Ins.:		<u>10</u>	<u>7 3/4</u>	<u>7 1/2</u>	<u>—</u>	<u>10 1/2</u>	<u>7 1/2</u>	<u>7</u>	<u>—</u>
Cone Penetrometer Readings in Track	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Cone Penetrometer Readings in Mud, psi	3"	<u>2</u>	<u>4</u>	<u>2</u>	<u>—</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>—</u>
	6"	<u>10</u>	<u>10</u>	<u>5</u>	<u>—</u>	<u>10</u>	<u>5</u>	<u>6</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer Readings in Track, psi	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer Readings in Mud, psi	3"	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>
	6"	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

Date: 10-22-73 Time: 12:50 PM Test Vehicle: M34 6x6
 Vehicle Weight, Truck: 11,536 LBS Trailer: 110 Tire Group: D
 Inflation, psig: 35 Ambient Temp. °F.: 69 Surface Temp. °F.: 62
 Relative Humidity %: 31 Wind Speed, mph: 2-3 Wind Direction: N

Sample Depth, Inches:

3	9	18
—	—	—

Mud Moisture Content, %: 25.7

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		6 3/4	3 1/2	—	—	7 1/4	7 3/8	—	—
Tire Track Width, Ins.:		9	7	—	—	8 1/2	7	—	—
Cone Penetrometer Readings in Track	3"	—	—	—	—	—	—	—	—
	6"	—	—	—	—	—	—	—	—
	9"	—	—	—	—	—	—	—	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
	21"	—	—	—	—	—	—	—	—
	24"	—	—	—	—	—	—	—	—
Cone Penetrometer Readings in Mud, psi	3"	5	10	—	—	5	5	—	—
	6"	5	10	—	—	5	10	—	—
	9"	—	—	—	—	—	—	—	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
	21"	—	—	—	—	—	—	—	—
	24"	—	—	—	—	—	—	—	—
Plate Penetrometer Readings in Track, psi	3"	—	—	—	—	—	—	—	—
	6"	—	—	—	—	—	—	—	—
	9"	—	—	—	—	—	—	—	—
Plate Penetrometer Readings in Mud, psi	3"	0	0	—	—	0	0	—	—
	6"	0	0	—	—	0	0	—	—
	9"	—	—	—	—	—	—	—	—

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

Date: 10-22-73 Time: 1:15 PM Test Vehicle: M-34 6X6
 Vehicle Weight, Truck: 11536 LBS Trailer: NA Tire Group: D
 Inflation, psig: 15 Ambient Temp. °F.: 68 Surface Temp. °F.: 62
 Relative Humidity %: 32 Wind Speed, mph: 3-13 Wind Direction: S

Sample Depth, Inches:

3	9	18
—	—	—

Mud Moisture Content, %: 25.7

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		7	7 3/4	—	—	6 3/4	8 1/2	—	—
Tire Track Width, Ins.:		8	7 1/4	—	—	7 1/4	8 1/4	—	—
Cone Penetrometer Readings in Track	3"	—	—	—	—	—	—	—	—
	6"	—	—	—	—	—	—	—	—
	9"	—	—	—	—	—	—	—	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
	21"	—	—	—	—	—	—	—	—
	24"	—	—	—	—	—	—	—	—
Cone Penetrometer Readings in Mud, psi	3"	4	10	—	—	2	5	—	—
	6"	10	10	—	—	10	5	—	—
	9"	—	—	—	—	—	—	—	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
	21"	—	—	—	—	—	—	—	—
	24"	—	—	—	—	—	—	—	—
Plate Penetrometer Readings in Track, psi	3"	—	—	—	—	—	—	—	—
	6"	—	—	—	—	—	—	—	—
	9"	—	—	—	—	—	—	—	—
Plate Penetrometer Readings in Mud, psi	3"	—	—	—	—	—	—	—	—
	6"	—	—	—	—	—	—	—	—
	9"	—	—	—	—	—	—	—	—

Comments: _____

OS - Off Scale (Full Scale = 300)

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

MOD

GROUP: A RUN NO. 5

4 WHEEL DRIVE

FIGURE NO. 30

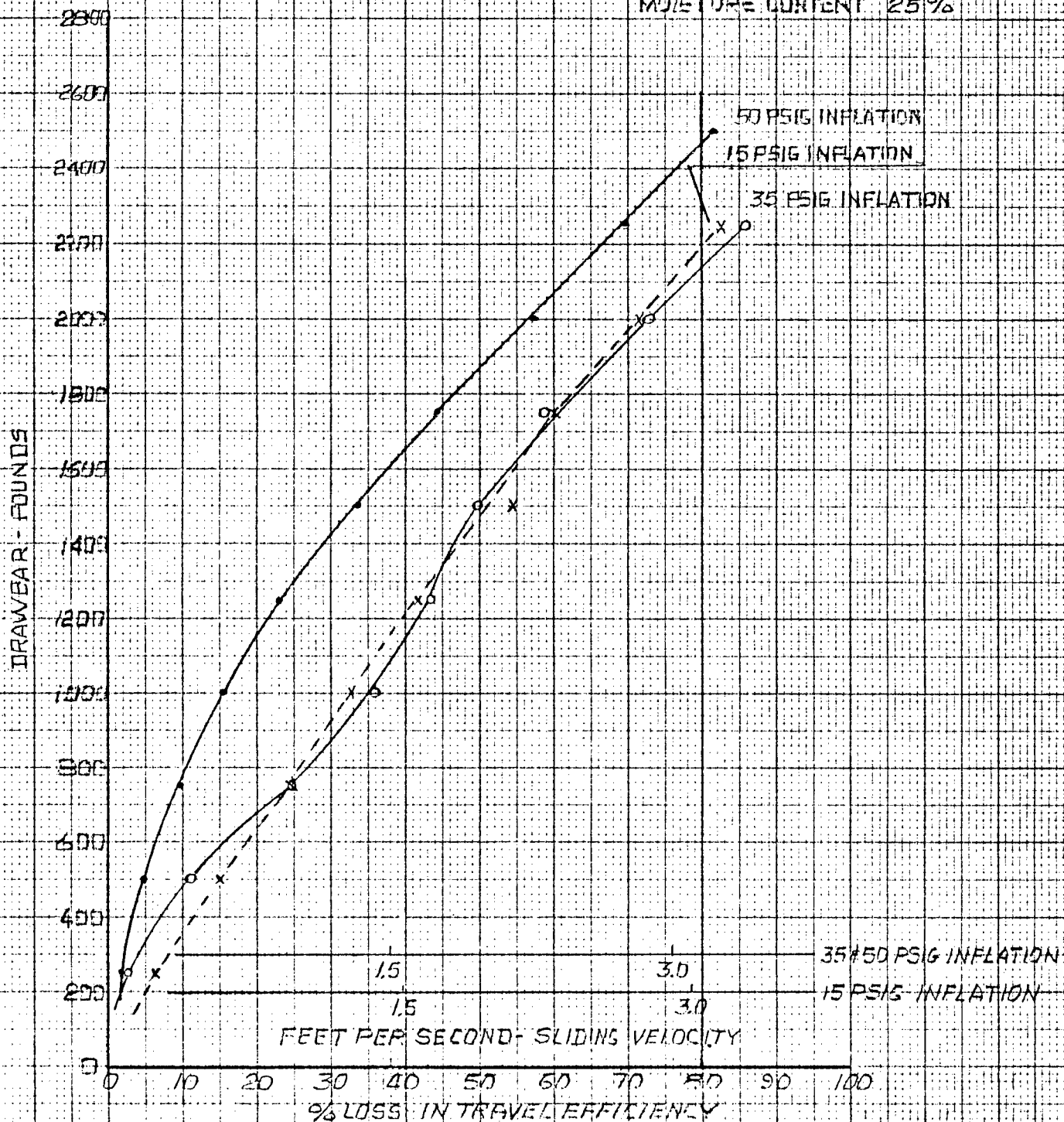
Location: PROVING GROUND

Date: 10-22-73

Test By: WBS

Data By: WBS

AMB. TEMP. RANGE 66°F
SURF. TEMP. RANGE 57°F
MOISTURE CONTENT 25%



TEST DATA

Date: 10-22-78 Time: 2:25 PM Test Vehicle: M-34 6x6
 Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: A
 Inflation, psig: 50 Ambient Temp. °F.: 70 Surface Temp. °F.: 62
 Relative Humidity %: 34 Wind Speed, mph: 6-22 Wind Direction: W

Mud Moisture Content, %:

Sample Depth, Inches		
3	9	18
24.2	-	-

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		8 1/2	8 3/4	8 1/2	-	7 1/2	9 3/4	8 1/2	-
Tire Track Width, Ins.:		7 3/4	7 1/2	8 1/2	-	7 1/2	8	8 1/2	-
Cone Penetrometer Readings in Track	3"	-	-	-	-	-	-	-	-
	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Cone Penetrometer Readings in Mud, psi	3"	5	5	5	-	5	5	5	-
	6"	5	10	10	-	5	5	10	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Track, psi	3"	-	-	-	-	-	-	-	-
	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Mud, psi	3"	0	0	0	-	0	0	0	-
	6"	0	0	0	-	0	0	0	-
	9"	-	-	-	-	-	-	-	-

Comments: _____

TEST DATA

Date: 10-22-73 Time: 2:40 PM Test Vehicle: M-34 6x6
 Vehicle Weight, Truck: 11,536 LBS Trailer: NA Tire Group: A
 Inflation, psig: 35 Ambient Temp. °F.: 64 Surface Temp. °F.: 58
 Relative Humidity %: 35 Wind Speed, mph: 6.20 Wind Direction: W

Sample Depth, Inches

Mud Moisture Content, %:

3	9	18
24.9	-	-

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		9	9 1/2	-	-	8 1/2	9 1/2	-	-
Tire Track Width, Ins.:		8 1/2	7 1/2	-	-	8	8	-	-
Cone Penetrometer Readings in Track	3"	-	-	-	-	-	-	-	-
	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
Cone Penetrometer Readings in Mud, psi	24"	-	-	-	-	-	-	-	-
	3"	5	2	-	-	5	5	-	-
	6"	10	10	-	-	10	10	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Track, psi	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
	3"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Mud, psi	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	3"	0	0	-	-	0	0	-	-
Plate Penetrometer Readings in Mud, psi	6"	0	0	-	-	0	0	-	-
	9"	-	-	-	-	-	-	-	-

Comments: _____

TEST DATA

Date: 10-20-73 Time: 3:15 PM Test Vehicle: M-34 6x6
 Vehicle Weight, Truck: 11,536 LBS Trailer: 11 Tire Group: A
 Inflation, psig: 15 Ambient Temp. °F.: 62 Surface Temp. °F.: 57
 Relative Humidity %: 35 Wind Speed, mph: 6-20 Wind Direction: W

Sample Depth, Inches

3	9	18
-	-	-

Mud Moisture Content, %: 24.9

		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Run Number:									
Tire Track Depth, Ins.:		<u>9 1/4</u>	<u>9 1/8</u>	<u>-</u>	<u>-</u>	<u>8 1/2</u>	<u>10</u>	<u>-</u>	<u>-</u>
Tire Track Width, Ins.:		<u>3 1/2</u>	<u>7 3/4</u>	<u>-</u>	<u>-</u>	<u>2</u>	<u>8</u>	<u>-</u>	<u>-</u>
Cone Penetrometer	3"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Readings in Track	6"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	12"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	15"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer	3"	<u>3</u>	<u>2</u>	<u>-</u>	<u>-</u>	<u>2</u>	<u>2</u>	<u>-</u>	<u>-</u>
Readings in	6"	<u>5</u>	<u>5</u>	<u>-</u>	<u>-</u>	<u>5</u>	<u>5</u>	<u>-</u>	<u>-</u>
Mud, psi	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	12"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	15"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer	3"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Readings in Track,	6"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
psi	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer	3"	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>
Readings in	6"	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>
Mud, psi	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

MUD

GROUP E RUN NO. 6

6 WHEEL DRIVE

FIGURE NO. 31

Location: PROVING GROUND

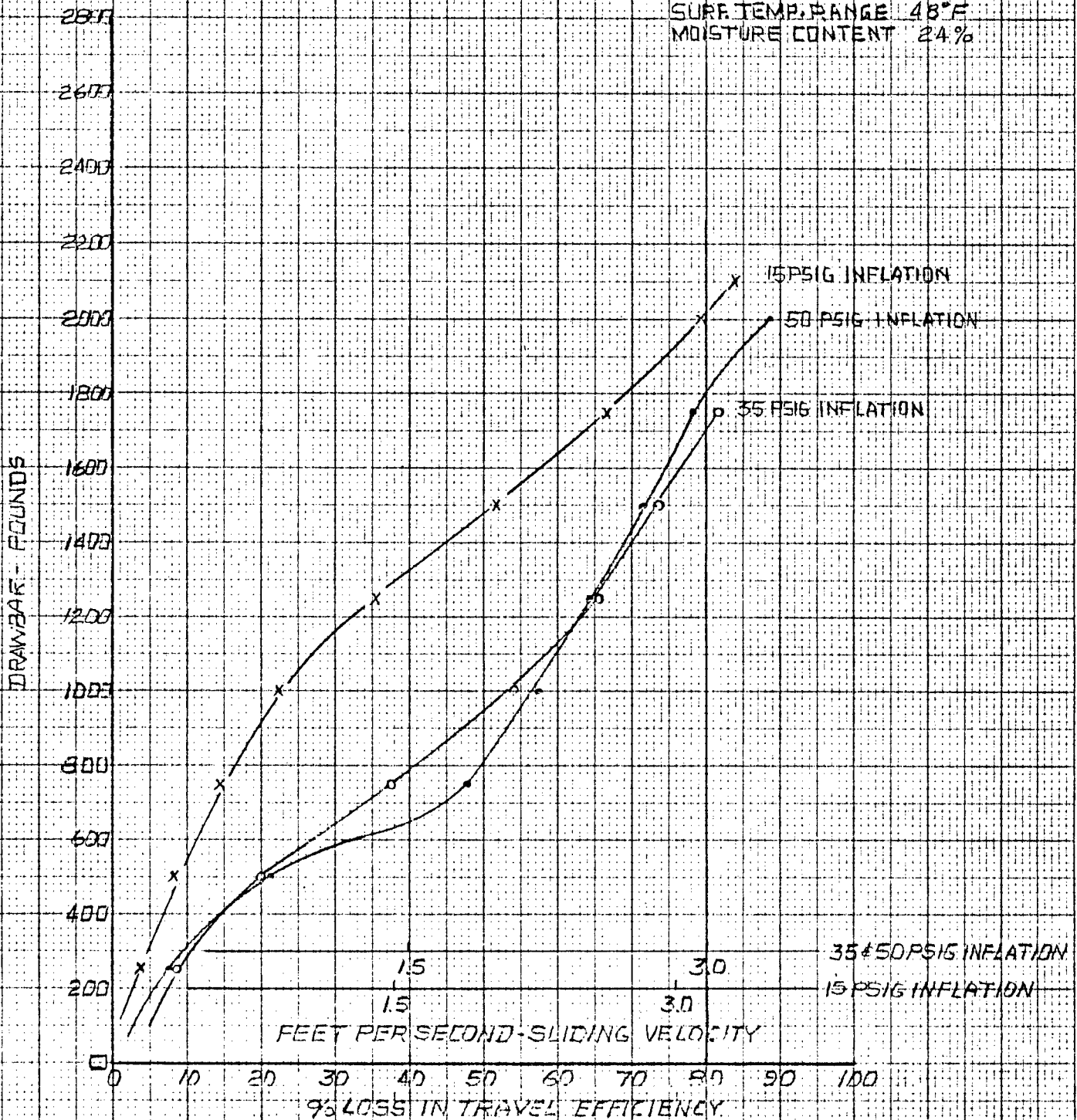
Date: 10-23-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 50°F

SURF. TEMP. RANGE 48°F

MOISTURE CONTENT 24%



TEST DATA

Date: 10-23-73 Time: 10:55 AM Test Vehicle: 11-34 616

Vehicle Weight, Truck: 11,536 LBS Trailer: NO Tire Group: E

Inflation, psig: 50 Ambient Temp. °F.: 50 Surface Temp. °F.: 47

Relative Humidity %: 56 Wind Speed, mph: 6-18 Wind Direction: W

Sample Depth, Inches:

3	9	18
—	—	—

Mud Moisture Content, %: 23.5

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>7³/₄</u>	<u>7</u>	—	—	<u>8¹/₄</u>	<u>9</u>	—	—
Tire Track Width, Ins.:		<u>8¹/₄</u>	<u>8³/₄</u>	—	—	<u>7³/₄</u>	<u>8</u>	—	—
Cone Penetrometer Readings in Track	3"	—	—	—	—	—	—	—	—
	6"	—	—	—	—	—	—	—	—
	9"	—	—	—	—	—	—	—	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
	21"	—	—	—	—	—	—	—	—
	24"	—	—	—	—	—	—	—	—
Cone Penetrometer Readings in Mud, psi	3"	<u>5</u>	<u>5</u>	—	—	<u>5</u>	<u>5</u>	—	—
	6"	<u>5</u>	<u>5</u>	—	—	<u>5</u>	<u>5</u>	—	—
	9"	—	—	—	—	—	—	—	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
	21"	—	—	—	—	—	—	—	—
	24"	—	—	—	—	—	—	—	—
Plate Penetrometer Readings in Track, psi	3"	—	—	—	—	—	—	—	—
	6"	—	—	—	—	—	—	—	—
	9"	—	—	—	—	—	—	—	—
Plate Penetrometer Readings in Mud, psi	3"	<u>0</u>	<u>0</u>	—	—	<u>0</u>	<u>0</u>	—	—
	6"	<u>0</u>	<u>0</u>	—	—	<u>0</u>	<u>0</u>	—	—
	9"	—	—	—	—	—	—	—	—

Comments: _____

TEST DATA

Date: 10-23-73 Time: 11:20 AM Test Vehicle: M-34 6x6
 Vehicle Weight, Truck: 11,536 LBS Trailer: 11A Tire Group: E
 Inflation, psig: 35 Ambient Temp. °F.: 50 Surface Temp. °F.: 48
 Relative Humidity %: 54 Wind Speed, mph: 5-15 Wind Direction: W

Sample Depth, Inches:

Mud Moisture Content, %: 23.5

3	9	18
—	—	—

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>8 1/2</u>	<u>9</u>	<u>—</u>	<u>—</u>	<u>8 1/2</u>	<u>8 1/2</u>	<u>—</u>	<u>—</u>
Tire Track Width, Ins.:		<u>7 1/2</u>	<u>8</u>	<u>—</u>	<u>—</u>	<u>8 1/2</u>	<u>7 1/2</u>	<u>—</u>	<u>—</u>
Cone Penetrometer Readings in Track	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Cone Penetrometer Readings in Mud, psi	3"	<u>4</u>	<u>5</u>	<u>—</u>	<u>—</u>	<u>2</u>	<u>2</u>	<u>—</u>	<u>—</u>
	6"	<u>10</u>	<u>5</u>	<u>—</u>	<u>—</u>	<u>10</u>	<u>10</u>	<u>—</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer Readings in Track, psi	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer Readings in Mud, psi	3"	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>
	6"	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Comments: _____

TEST DATA

Date: 10-23-73 Time: 11:45AM Test Vehicle: 14-21 6x6
 Vehicle Weight, Truck: 11536 LBS Trailer: 110 Tire Group: E
 Inflation, psig: 15 Ambient Temp. °F.: 51 Surface Temp. °F.: 48
 Relative Humidity %: 52 Wind Speed, mph: 5-20 Wind Direction: W

Sample Depth, Inches:

3	9	18
—	—	—

Mud Moisture Content, %: 23.5

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>7 1/8</u>	<u>8 1/4</u>	—	—	<u>7 1/4</u>	<u>7 3/8</u>	—	—
Tire Track Width, Ins.:		<u>8</u>	<u>7 1/4</u>	—	—	<u>8 1/4</u>	<u>7</u>	—	—
Cone Penetrometer Readings in Track	3"	—	—	—	—	—	—	—	—
	6"	—	—	—	—	—	—	—	—
	9"	—	—	—	—	—	—	—	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
	21"	—	—	—	—	—	—	—	—
Cone Penetrometer Readings in Mud, psi	24"	—	—	—	—	—	—	—	—
	3"	<u>5</u>	<u>5</u>	—	—	<u>2</u>	<u>2</u>	—	—
	6"	<u>10</u>	<u>10</u>	—	—	<u>10</u>	<u>10</u>	—	—
	9"	—	—	—	—	—	—	—	—
	12"	—	—	—	—	—	—	—	—
	15"	—	—	—	—	—	—	—	—
	18"	—	—	—	—	—	—	—	—
Plate Penetrometer Readings in Track, psi	21"	—	—	—	—	—	—	—	—
	24"	—	—	—	—	—	—	—	—
	3"	—	—	—	—	—	—	—	—
Plate Penetrometer Readings in Mud, psi	6"	—	—	—	—	—	—	—	—
	9"	—	—	—	—	—	—	—	—
	3"	<u>0</u>	<u>0</u>	—	—	<u>0</u>	<u>0</u>	—	—
Plate Penetrometer Readings in Mud, psi	6"	<u>0</u>	<u>0</u>	—	—	<u>0</u>	<u>0</u>	—	—
	9"	—	—	—	—	—	—	—	—

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

MUD

GROUP: G RUN NO 7

6 WHEEL DRIVE

FIGURE NO. 32

Location: PROVING GROUND

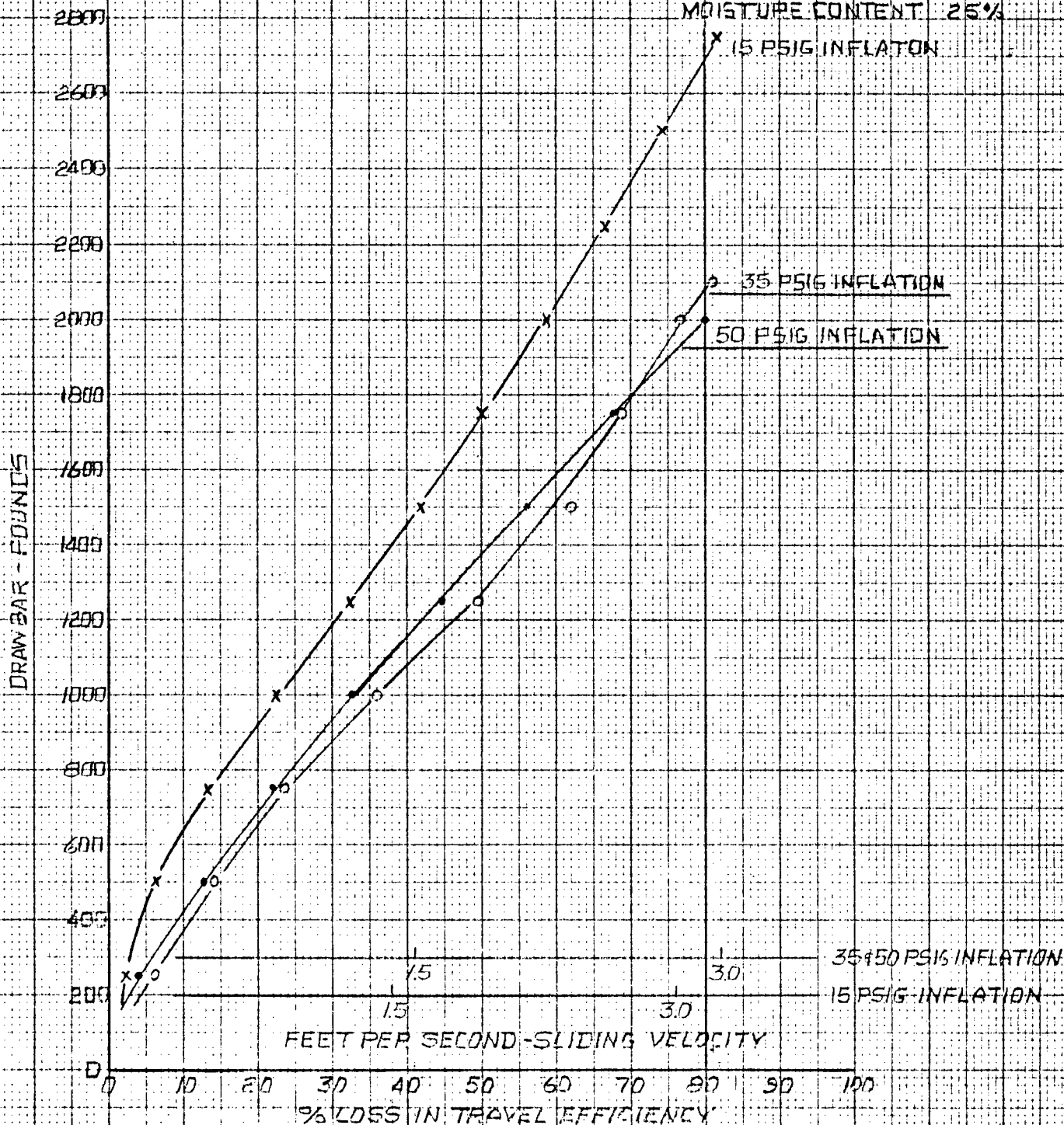
Date: 10-23-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 55°F

SURF. TEMP. RANGE 54°F

MOISTURE CONTENT 25%



TEST DATA

Date: 10-23-73 Time: 1:25 PM Test Vehicle: M34 6x6
 Vehicle Weight, Truck: 11536 LBS Trailer: 11A Tire Group: G
 Inflation, psig: 50 Ambient Temp. °F.: 54 Surface Temp. °F.: 52
 Relative Humidity %: 46 Wind Speed, mph: 6-22 Wind Direction: W

Mud Moisture Content, %: 25.3

Sample Depth, Inches

3	9	18
—	—	—

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>6 3/4</u>	<u>7 3/4</u>	<u>7 3/4</u>	<u>—</u>	<u>7 1/2</u>	<u>9</u>	<u>9 1/4</u>	<u>—</u>
Tire Track Width, Ins.:		<u>10</u>	<u>7 1/2</u>	<u>6 3/4</u>	<u>—</u>	<u>9 3/4</u>	<u>7 1/4</u>	<u>6 1/2</u>	<u>—</u>
Cone Penetrometer Readings in Track	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Cone Penetrometer Readings in Mud, psi	3"	<u>2</u>	<u>2</u>	<u>4</u>	<u>—</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>—</u>
	6"	<u>10</u>	<u>10</u>	<u>10</u>	<u>—</u>	<u>10</u>	<u>10</u>	<u>5</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	12"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	15"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	18"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	21"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	24"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer Readings in Track, psi	3"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	6"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
Plate Penetrometer Readings in Mud, psi	3"	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>
	6"	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>—</u>
	9"	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>

Comments: _____

TEST DATA

Date: 10-23-73 Time: 1:50 PM Test Vehicle: 1134 6x6
 Vehicle Weight, Truck: 11536 LBS Trailer: 111 Tire Group: G
 Inflation, psig: 35 Ambient Temp. °F.: 55 Surface Temp. °F.: 54
 Relative Humidity %: 44 Wind Speed, mph: 6-20 Wind Direction: W

Sample Depth, Inches:

3	9	18
-	-	-

Mud Moisture Content, %: 25.3

		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Run Number:									
Tire Track Depth, Ins.:		<u>7 1/4</u>	<u>7 5/8</u>	-	-	<u>7 1/2</u>	<u>8 1/2</u>	-	-
Tire Track Width, Ins.:		<u>9</u>	<u>7 1/2</u>	-	-	<u>8 1/2</u>	<u>7 1/4</u>	-	-
Cone Penetrometer	3"	-	-	-	-	-	-	-	-
Readings in Track	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Cone Penetrometer	3"	<u>5</u>	<u>5</u>	-	-	<u>5</u>	<u>2</u>	-	-
Readings in	6"	<u>10</u>	<u>10</u>	-	-	<u>10</u>	<u>5</u>	-	-
Mud, psi	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Plate Penetrometer	3"	-	-	-	-	-	-	-	-
Readings in Track,	6"	-	-	-	-	-	-	-	-
psi	9"	-	-	-	-	-	-	-	-
Plate Penetrometer	3"	<u>0</u>	<u>0</u>	-	-	<u>0</u>	<u>0</u>	-	-
Readings in	6"	<u>0</u>	<u>0</u>	-	-	<u>0</u>	<u>0</u>	-	-
Mud, psi	9"	-	-	-	-	-	-	-	-

Comments: _____

TEST DATA

Date: 10-23-73 Time: 2:10 PM Test Vehicle: 1734 6x6
 Vehicle Weight, Truck: 11,526 LBS Trailer: 111 Tire Group: G
 Inflation, psig: 135 Ambient Temp. °F.: 55 Surface Temp. °F.: 54
 Relative Humidity %: 42 Wind Speed, mph: 6-20 Wind Direction: W

Sample Depth, Inches

3	9	18
-	-	-

Mud Moisture Content, %: 25.3

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		6 3/4	8 3/4	8 3/4	-	8 1/4	10	8 3/4	-
Tire Track Width, Ins.:		9 1/4	7 3/4	10	-	8 1/4	7 3/4	10 1/4	-
Cone Penetrometer Readings in Track	3"	-	-	-	-	-	-	-	-
	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Cone Penetrometer Readings in Mud, psi	3"	5	5	5	-	5	5	5	-
	6"	10	10	10	-	10	15	10	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Track, psi	3"	-	-	-	-	-	-	-	-
	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Mud, psi	3"	0	0	0	-	0	0	0	-
	6"	0	0	0	-	0	0	0	-
	9"	-	-	-	-	-	-	-	-

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

MUD

GROUP: F RUN NO. 8

6 WHEEL DRIVE

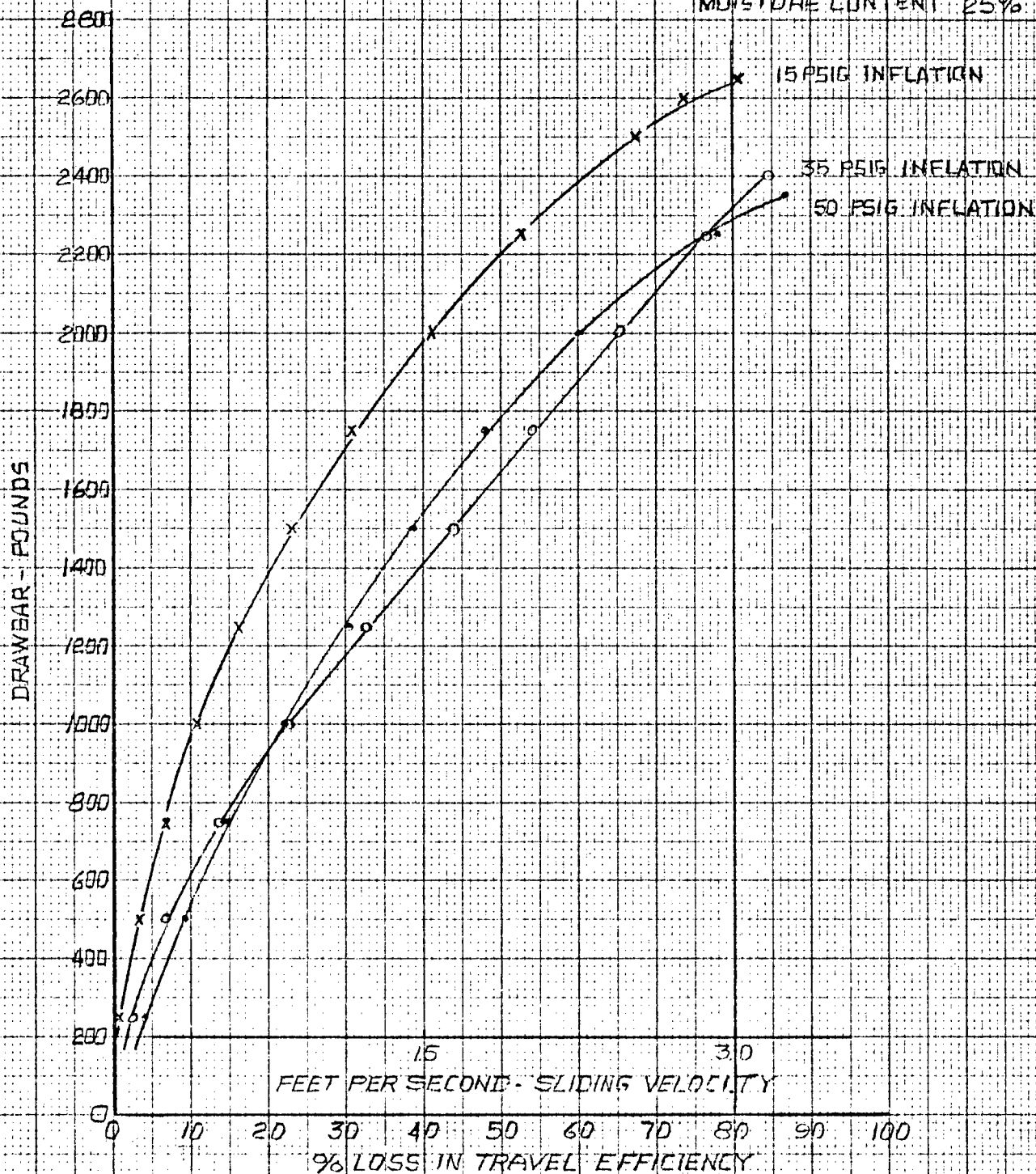
FIGURE NO. 33

Location: PROVING GROUND

Date: 10-24-73 Test By: WYHS

Data By: WYHS

AMB. TEMP. RANGE 44°F
SURF. TEMP. RANGE 50°F
MOISTURE CONTENT 25%



TEST DATA

Date: 10-24-73 Time: 9:30AM Test Vehicle: 1434 6x6

Vehicle Weight, Truck: 11536 LBS Trailer: 1/A Tire Group: F

Inflation, psig: 50 Ambient Temp. °F.: 33 Surface Temp. °F.: 36

Relative Humidity %: 64 Wind Speed, mph: 0-3 Wind Direction: W

Mud Moisture Content, %: 25.5

Sample Depth, Inches

3	9	18
-	-	-

Run Number:		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		<u>7 1/2</u>	<u>7 1/2</u>	<u>-</u>	<u>-</u>	<u>7 1/2</u>	<u>9</u>	<u>-</u>	<u>-</u>
Tire Track Width, Ins.:		<u>7 1/2</u>	<u>6 1/2</u>	<u>-</u>	<u>-</u>	<u>9</u>	<u>7</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Track	3"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	6"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	12"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	15"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Cone Penetrometer Readings in Mud, psi	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	3"	<u>10</u>	<u>10</u>	<u>-</u>	<u>-</u>	<u>10</u>	<u>10</u>	<u>-</u>	<u>-</u>
	6"	<u>10</u>	<u>10</u>	<u>-</u>	<u>-</u>	<u>10</u>	<u>10</u>	<u>-</u>	<u>-</u>
	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	12"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	15"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	18"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Track, psi	21"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	24"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	3"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Plate Penetrometer Readings in Mud, psi	6"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
	3"	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>
	6"	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>	<u>0</u>	<u>0</u>	<u>-</u>	<u>-</u>
	9"	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>

Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

Date: 10-24-73 Time: 10:30 AM Test Vehicle: M34 616
 Vehicle Weight, Truck: 11536 LBS Trailer: 116 Tire Group: F
 Inflation, psig: 35 Ambient Temp. °F.: 44 Surface Temp. °F.: 50
 Relative Humidity %: 59 Wind Speed, mph: 0-2 Wind Direction: W

Sample Depth, Inches

3	9	18
-	-	-

Mud Moisture Content, %: 25.5

		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Run Number:									
Tire Track Depth, Ins.:		8	7 1/2	-	-	7	8	-	-
Tire Track Width, Ins.:		7 1/4	7 1/4	-	-	7 3/4	7 1/2	-	-
Cone Penetrometer	3"	-	-	-	-	-	-	-	-
Readings in Track	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Cone Penetrometer	3"	4	5	-	-	2	5	-	-
Readings in	6"	10	5	-	-	10	5	-	-
Mud, psi	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Plate Penetrometer	3"	-	-	-	-	-	-	-	-
Readings in Track,	6"	-	-	-	-	-	-	-	-
psi	9"	-	-	-	-	-	-	-	-
Plate Penetrometer	3"	0	0	-	-	0	0	-	-
Readings in	6"	0	0	-	-	0	0	-	-
Mud, psi	9"	-	-	-	-	-	-	-	-

Comments: _____

TEST DATA

Date: 10-24-73 Time: 11:00 AM Test Vehicle: M 34 616
 Vehicle Weight, Truck: 11,536 LBS Trailer: 11A Tire Group: F
 Inflation, psig: 15 Ambient Temp. °F.: 46 Surface Temp. °F.: 52
 Relative Humidity %: 54 Wind Speed, mph: 0-3 Wind Direction: W

Sample Depth, Inches

3	9	18
-	-	-

Mud Moisture Content, %: 25.5

		Left Rear				Right Rear			
		1	2	3	4	1	2	3	4
Run Number:									
Tire Track Depth, Ins.:		8 1/2	7	-	-	7	8	-	-
Tire Track Width, Ins.:		8 1/4	7	-	-	8	7 3/4	-	-
Cone Penetrometer	3"	-	-	-	-	-	-	-	-
Readings in Track	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Cone Penetrometer	3"	5	5	-	-	2	5	-	-
Readings in	6"	10	10	-	-	10	10	-	-
Mud, psi	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
Plate Penetrometer	3"	-	-	-	-	-	-	-	-
Readings in Track,	6"	-	-	-	-	-	-	-	-
psi	9"	-	-	-	-	-	-	-	-
Plate Penetrometer	3"	0	0	-	-	0	0	-	-
Readings in	6"	0	0	-	-	0	0	-	-
Mud, psi	9"	-	-	-	-	-	-	-	-

Comments: _____

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

MUD

GROUP: C RUN NO. 9

6 WHEEL DRIVE

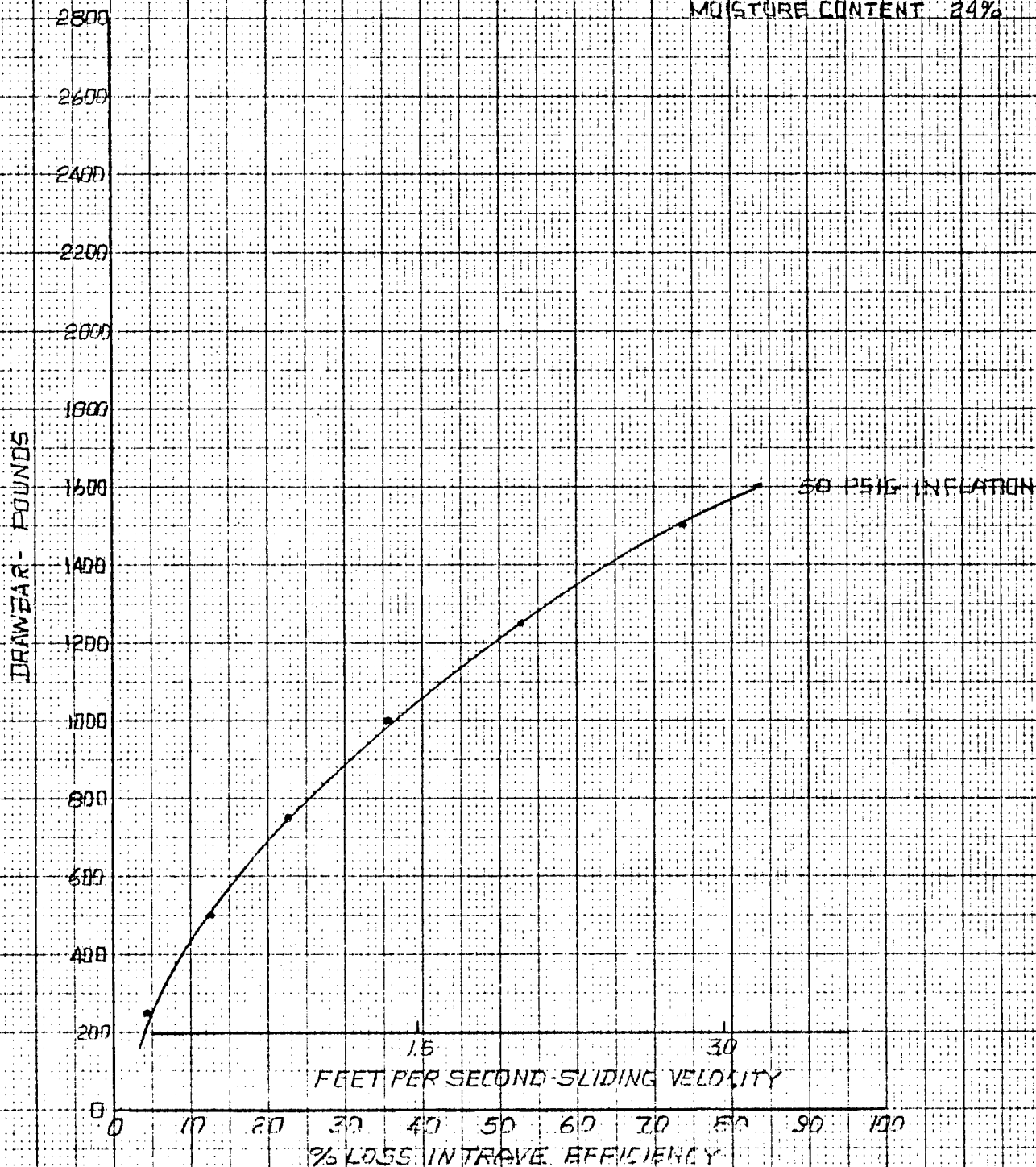
FIGURE NO. 34

Location: PROVING GROUND

Date: 10-24-73 Test By: WHE

Data By: WHE

AMB. TEMP. RANGE 51°F
SURF TEMP. RANGE 55°F
MOISTURE CONTENT 24%



TEST DATA

Date: 10-24-73 Time: 12:35 PM Test Vehicle: 1934 6x6
 Vehicle Weight, Truck: 11536 LBS Trailer: NA Tire Group: C
 Inflation, psig: 50 Ambient Temp. °F.: 51 Surface Temp. °F.: 55
 Relative Humidity %: 50 Wind Speed, mph: 0-4 Wind Direction: W

Sample Depth, Inches

Mud Moisture Content, %: 23.7

3	9	18
-	-	-

		Left Rear				Right Rear			
Run Number:		1	2	3	4	1	2	3	4
Tire Track Depth, Ins.:		7	7 ⁵ / ₃	7 ¹ / ₄	-	7 ¹ / ₂	7 ² / ₃	7 ¹ / ₂	-
Tire Track Width, Ins.:		7 ¹ / ₂	7 ¹ / ₃	7 ¹ / ₄	-	7	7 ¹ / ₂	6 ³ / ₄	-
Cone Penetrometer Readings in Track	3"	-	-	-	-	-	-	-	-
	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
	21"	-	-	-	-	-	-	-	-
Cone Penetrometer Readings in Mud, psi	24"	-	-	-	-	-	-	-	-
	3"	4	1	2	-	2	2	2	-
	6"	10	10	1	-	10	10	10	-
	9"	-	-	-	-	-	-	-	-
	12"	-	-	-	-	-	-	-	-
	15"	-	-	-	-	-	-	-	-
	18"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Track, psi	21"	-	-	-	-	-	-	-	-
	24"	-	-	-	-	-	-	-	-
	3"	-	-	-	-	-	-	-	-
Plate Penetrometer Readings in Mud, psi	6"	-	-	-	-	-	-	-	-
	9"	-	-	-	-	-	-	-	-
	3"	0	0	0	-	0	0	0	-
	6"	0	0	0	-	0	0	0	-
	9"	0	0	0	-	0	0	0	-

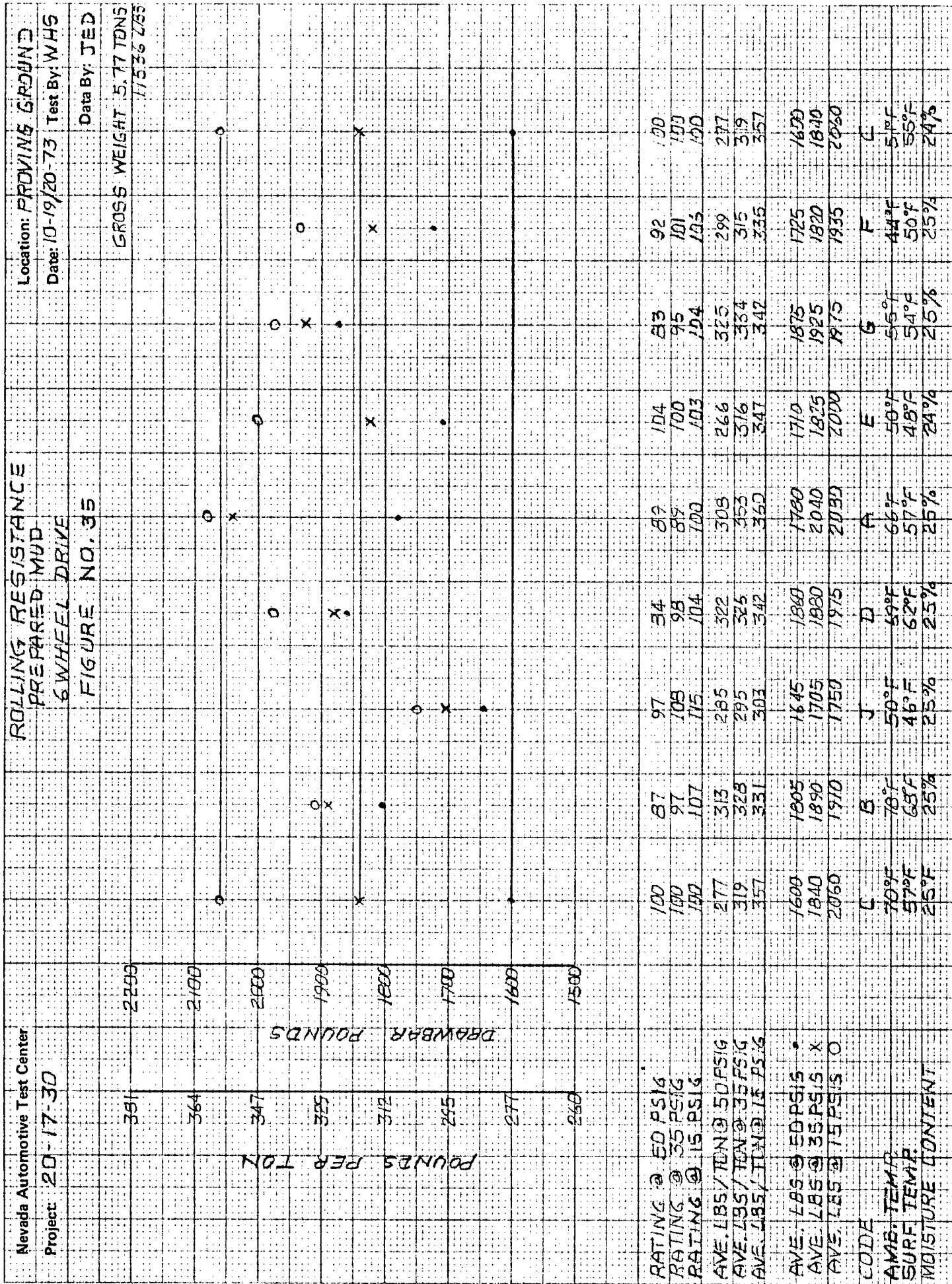
Comments: _____

OS - Off Scale (Full Scale = 300)

TEST DATA

Figure No. 35

Rolling Resistance - Prepared Mud



TEST DATA

Figure No. 36

Dynamic Traction Summary - Dry Ice

TEST DATA

Figures 37 through 45

Dynamic Traction - Dry Ice

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY ICE

GROUP: C RUN NO. 1

3 WHEEL DRIVE

FIGURE NO. 37

Location: SQUAW VALLEY CALIF

Date: 11-5-73

Test By: WHS

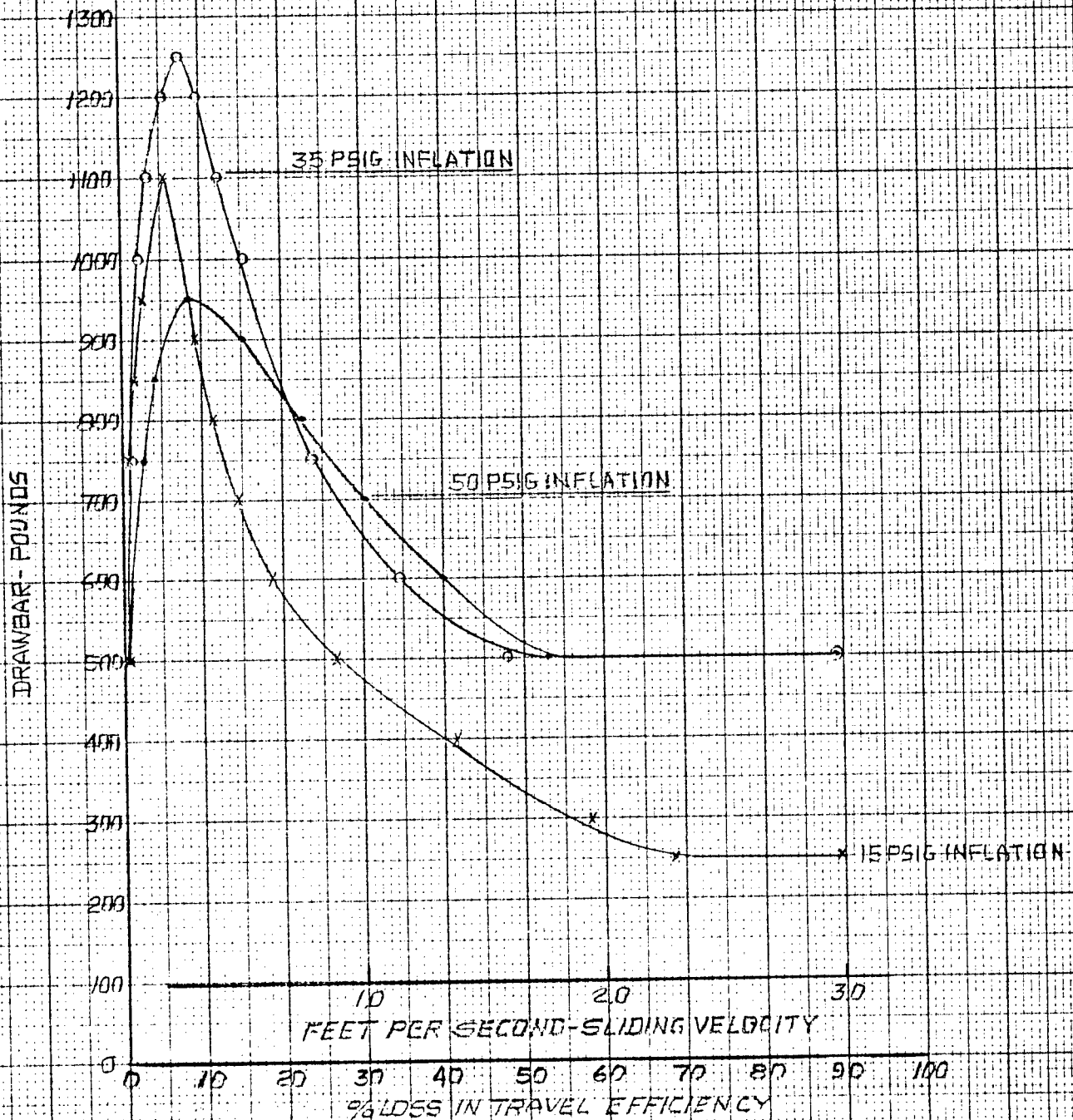
Data By: WHS

AMB. TEMP. RANGE

38°F

SURF. TEMP. RANGE

23°F



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
DRY ICE
GROUP E RUN NO. 2
2 WHEEL DRIVE
FIGURE NO. 38

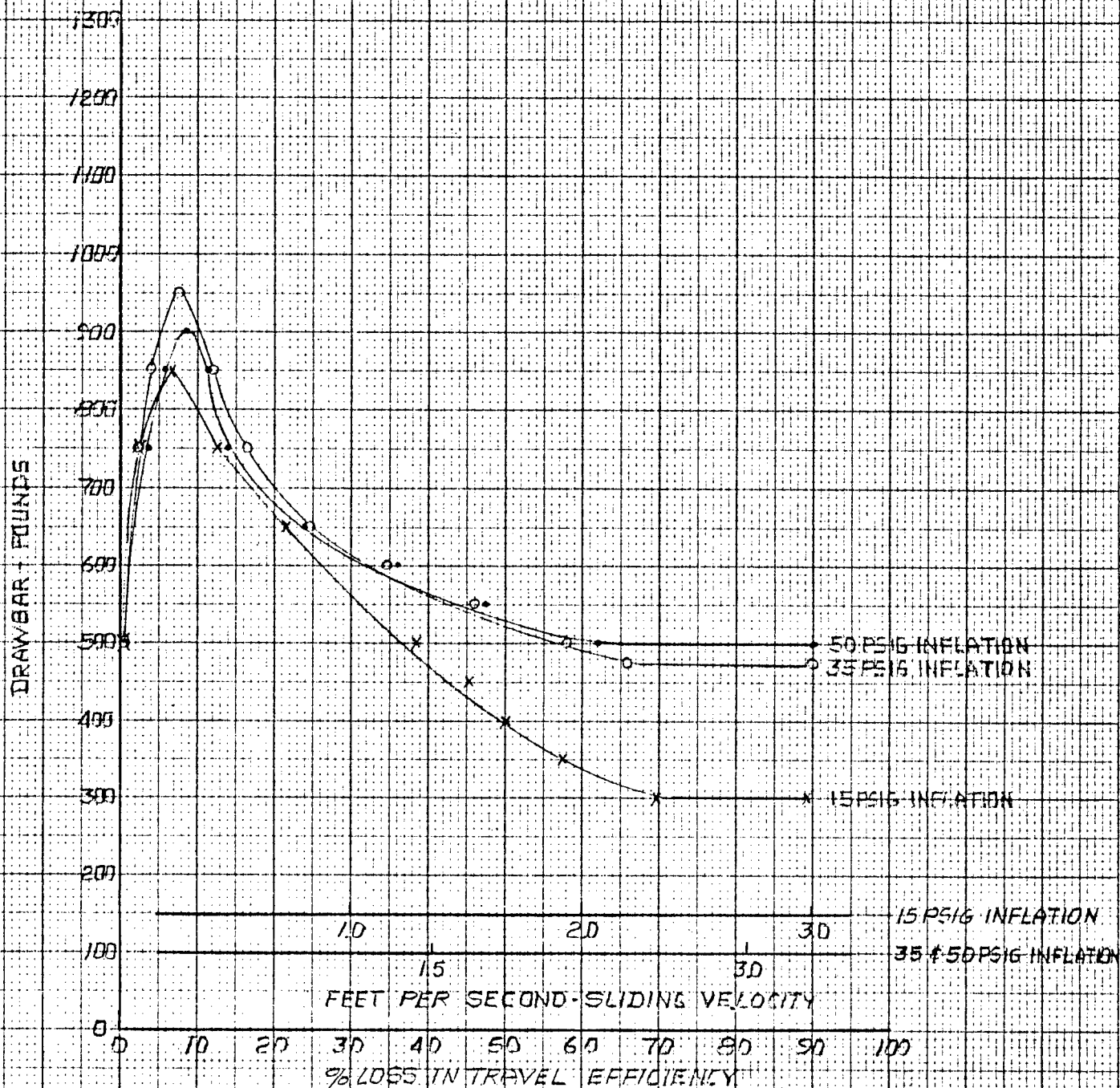
Location: SQUAW VALLEY, CALIF

Date: 11-5-73

Test By: WHS

Data By: WHS

AMB. TEMP RANGE 38°F
SURF TEMP RANGE 23°F



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
DRY ICE
GROUP A RUN NO. 3
2 WHEEL DRIVE
FIGURE NO. 39

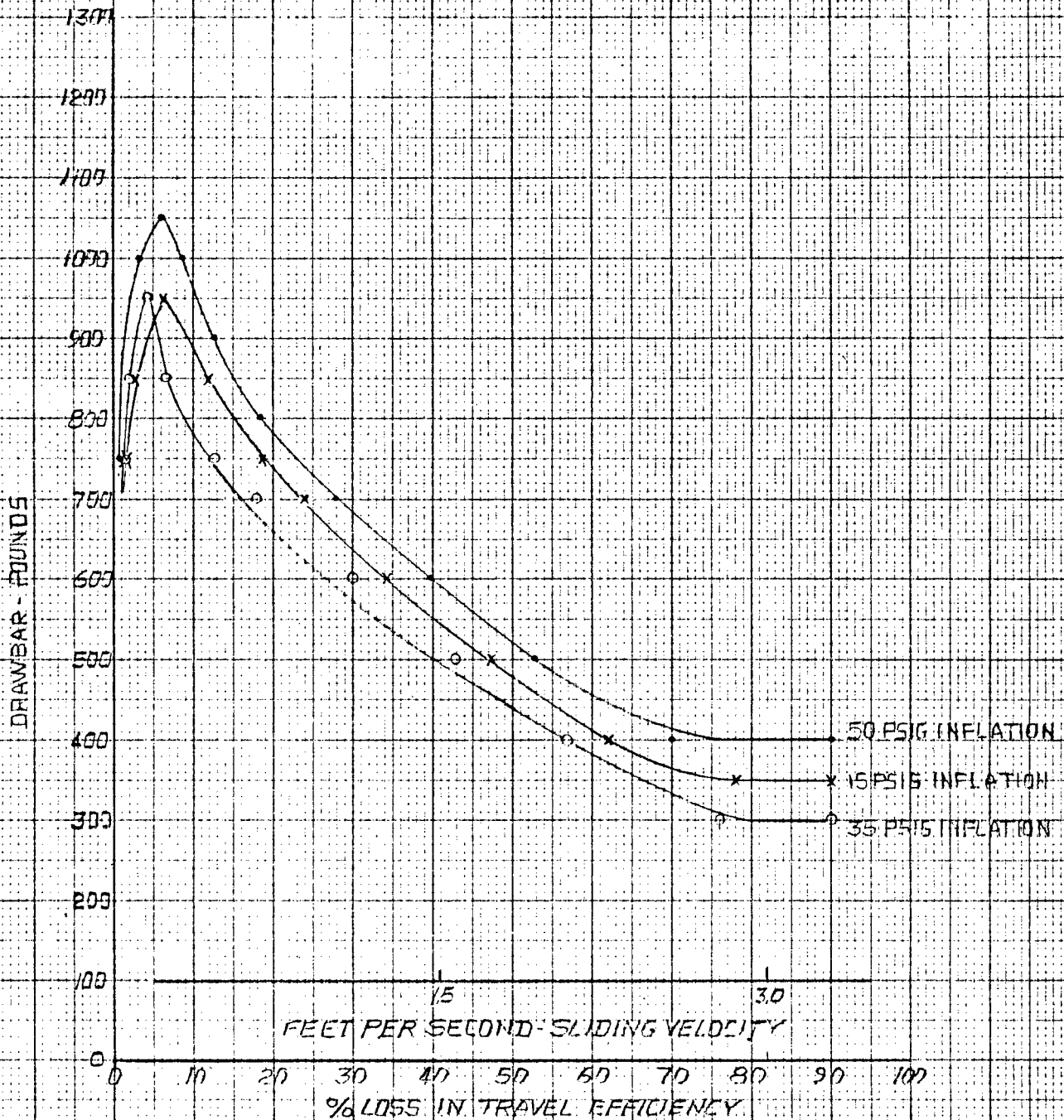
Location: SQUAW VALLEY, CALIF.

Date: 11-5-73

Test By: WHS

Data By: WHS

AIR TEMPERATURE 38°F
SURF. TEMP. RANGE 24°F



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

DRY ICE

GROUP D RUN NO. 4

2 WHEEL DRIVE

FIGURE NO. 40

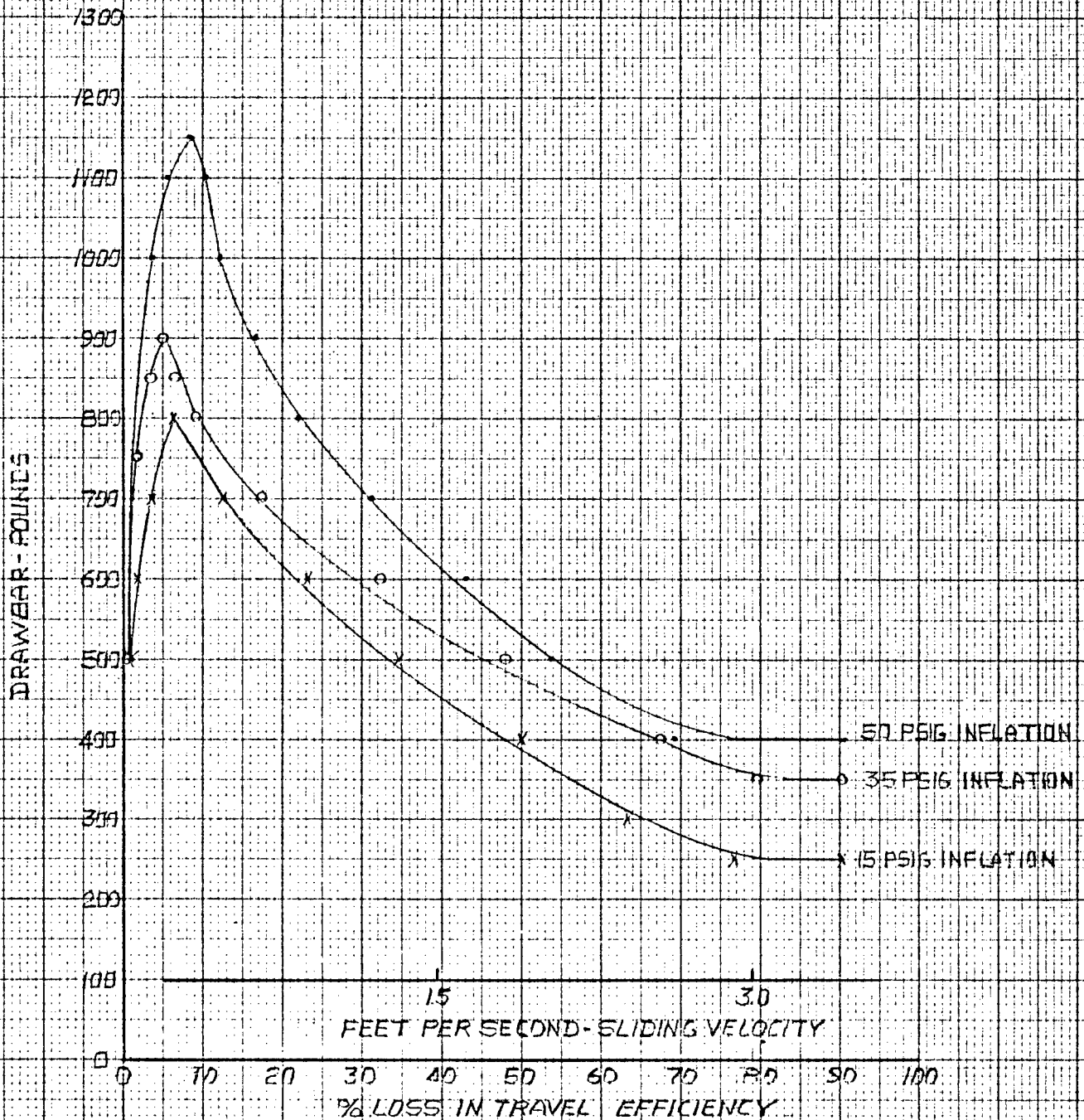
Location: SQUAW VALLEY, CALIF.

Date: 11-5-73

Test By: WHS

Data By: WHS

AIR TEMP RANGE 39°F
SURF. TEMP RANGE 24°F



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
DRY ICE
690 P.S.I. RUN NO. 5
2 WHEEL DRIVE
FIGURE NO. 41

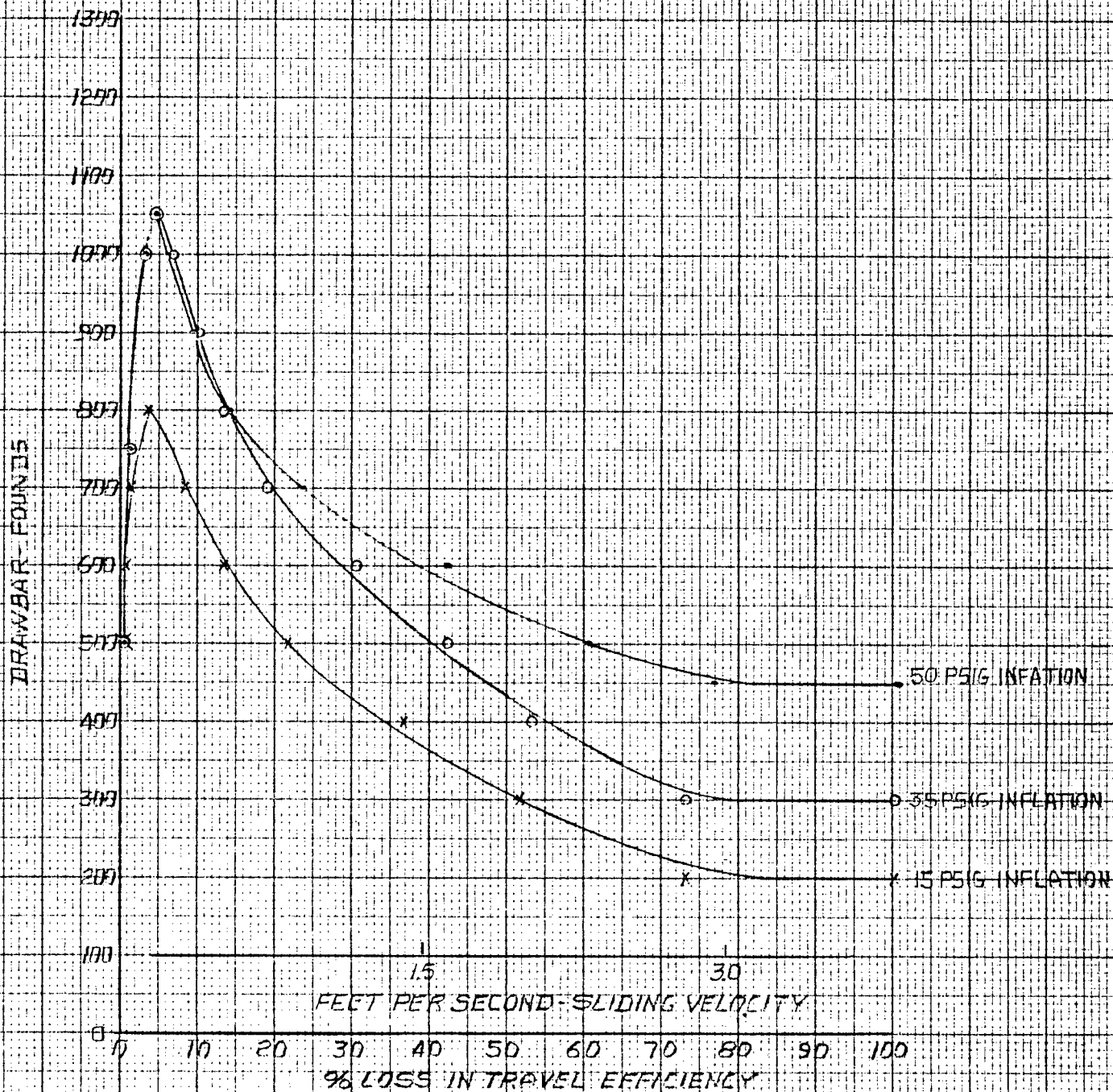
Location: SQUAW VALLEY CALIF

Date: 11-5-73

Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 39°F
SURF. TEMP. RANGE 24°F



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
DRY ICE
GROUP: B RUN NO. 6
2 WHEEL DRIVE
FIGURE NO. 42

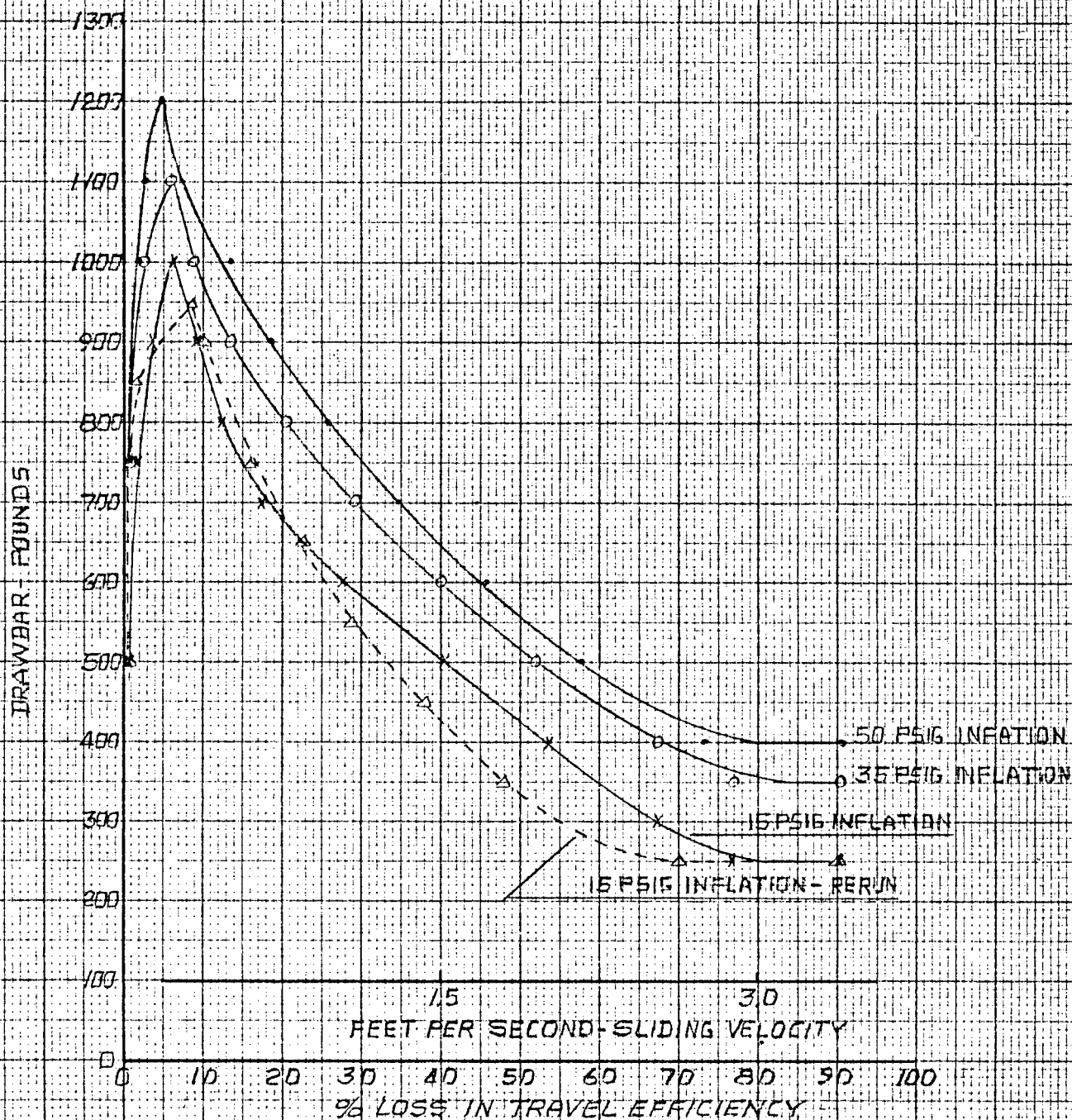
Location: SQUAW VALLEY, CALIF.

Date: 11-5-73

Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 39°F
SURE. TEMP. RANGE 24°F



Nevada Automotive Test Center

Project: 20-17-30

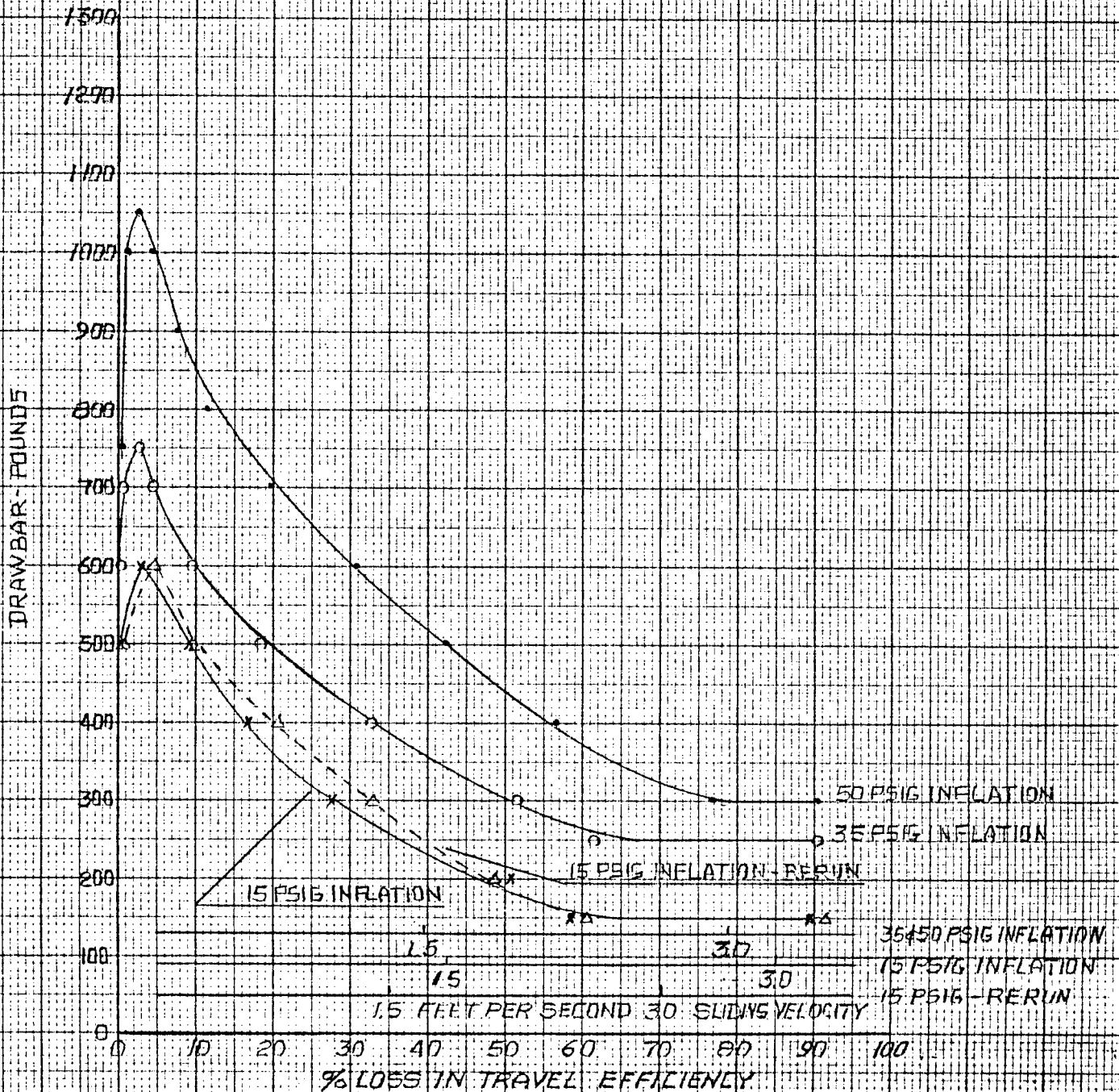
DYNAMIC TRACTION
ICE
GROUP J RUN NO. 7
2 WHEEL DRIVE
FIGURE NO. 43

Location: SQUAW VALLEY, CALIF.

Date: 11-5/6-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 39°
SURE TEMP. RANGE 25°



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC Traction
SERVICE
GROUP 2.6 RWN NO. 8
2 WHEEL DRIVE
FIGURE NO. 44

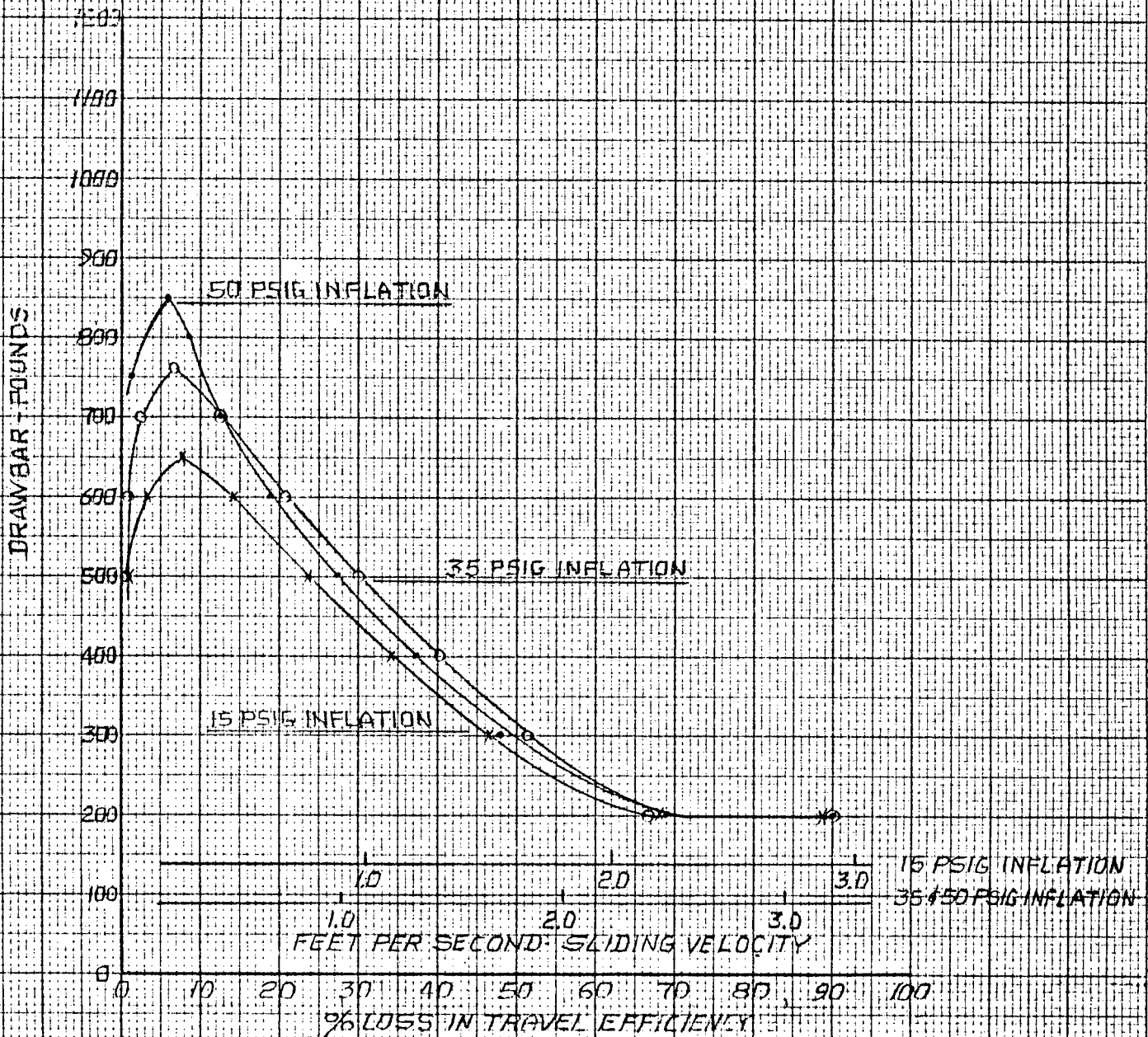
Location: SQUAW VALLEY, CALIF.

Date: 11-6-73

Test By: WH5

Data By: WH5

AMB. TEMP. RANGE 39°F
SURF TEMP. RANGE 24°F



Nevada Automotive Test Center

Project: 20-17-30

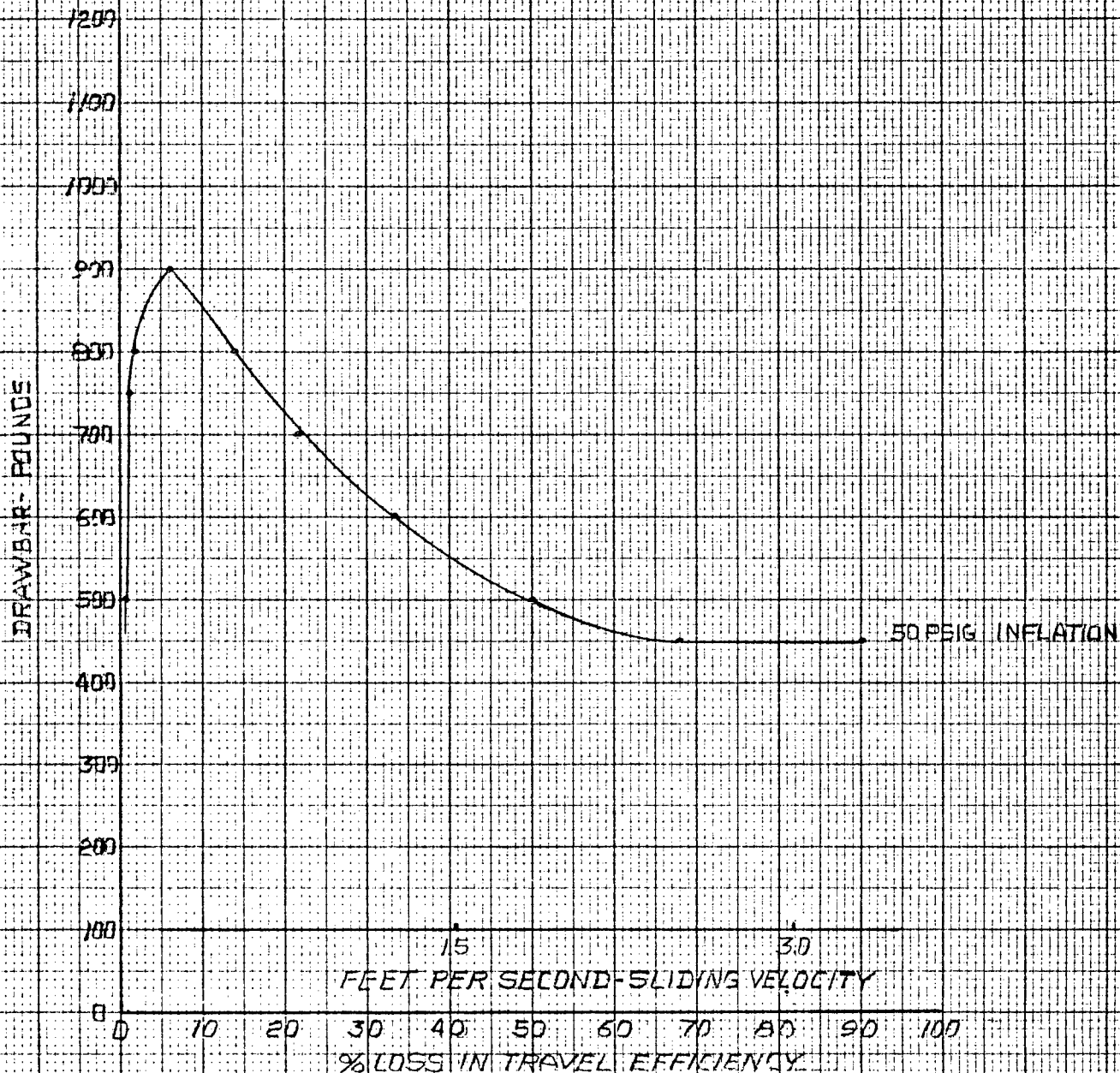
DYNAMIC TRACTION
DRY ICE
GROUP: C RUN NO. 2
2 WHEEL DRIVE
FIGURE NO. 45

Location: SQUAW VALLEY, CALIF.

Date: 11-6-73 Test By: WHS

Data By: WHS

AIR TEMP RANGE 39°F
SURF TEMP RANGE 25°F



TEST DATA

Figure No. 46

Rolling Resistance - Dry Ice

Location: SQUAW VALLEY, CAL.
Date: 11-5/6-73 Test By: WHS
Data By: WHS

ROLLING RESISTANCE
DRY ICE
TEMP

FILE NO. 46

ROLLING RESISTANCE 1.85/TON

15 PSIG INFLATION

CONFIDENTIAL

50-0515-1XFL4413Z

RATING @ 15 PSIG
RATING @ 35 PSIG
RATING @ 50 PSIG

AVE	LB57/TON	0.15	PSIG
AVE	LB57/TON	0.35	PSIG
AVE	LB57/TON	0.50	PSIG

CODE OF
AMEND
SURVEY

COLUMBIAN UNIVERSITY

NATC FORM 200BH 9-68

TEST DATA

Figure No. 47

Dynamic Traction Summary - Virgin Snow

TEST DATA

Figures 48 through 56

Dynamic Traction - Virgin Snow

Nevada Automotive Test Center

Project: 20-17-30

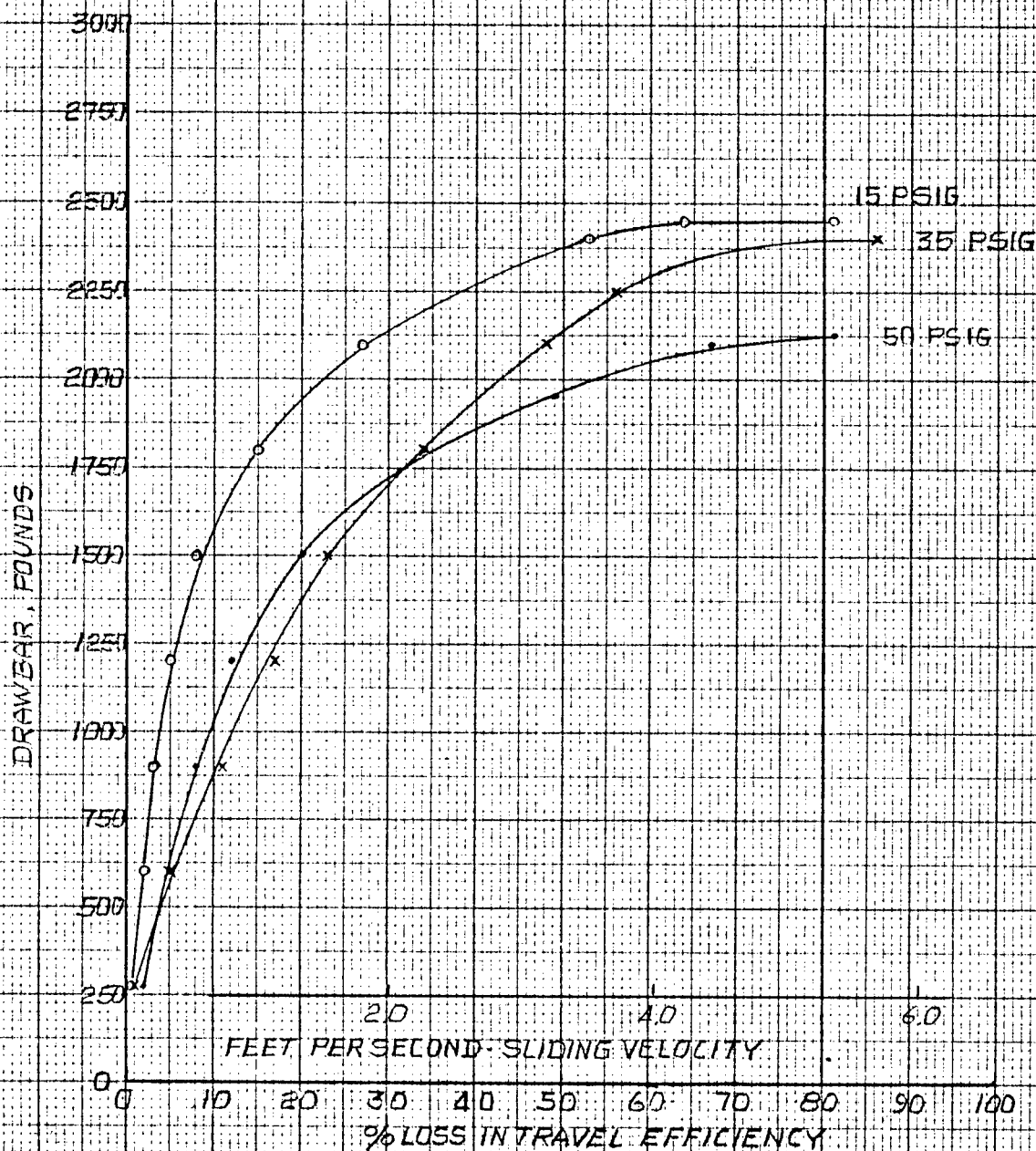
DYNAMIC TRACTION
VIRGIN SNOW
GROUP C RUN NO. 1
FIGURE NO. 48

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

FIRST RUN
4 WHEEL DRIVE
AMB. TEMP: 16°F
SNOW TEMP: 21°F
MOISTURE CONTENT: 14-17%



Nevada Automotive Test Center

Project 20-17-30

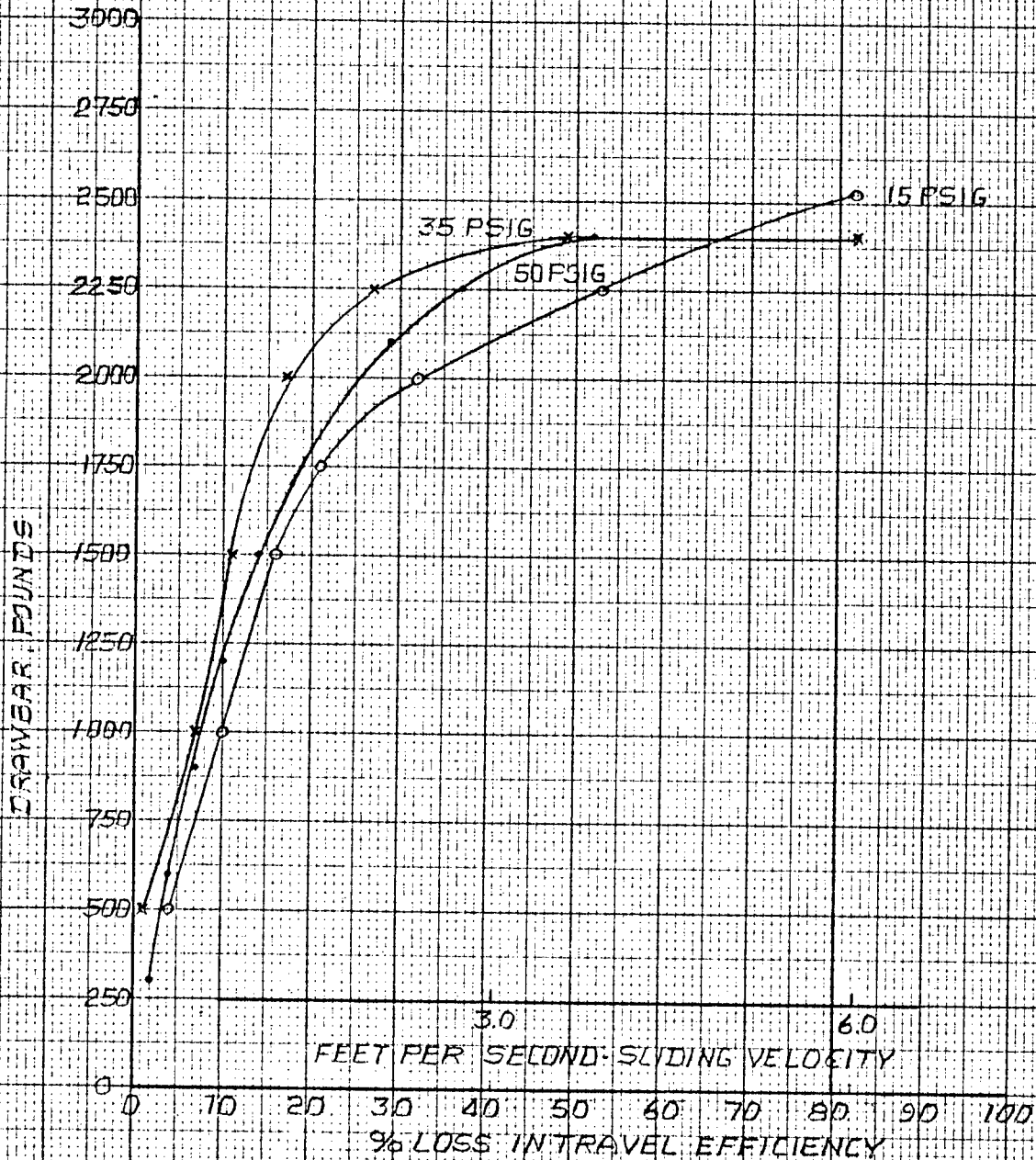
DYNAMIC TRACTION
VIRGIN SNOW
GROUP A RUN NO. 2
FIGURE NO. 49

Location: WEST YELLOWSTONE

Date 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP 0°F
SNOW TEMP 10°F
MOISTURE CONTENT: 14-17%



Nevada Automotive Test Center

Project 20-17-30

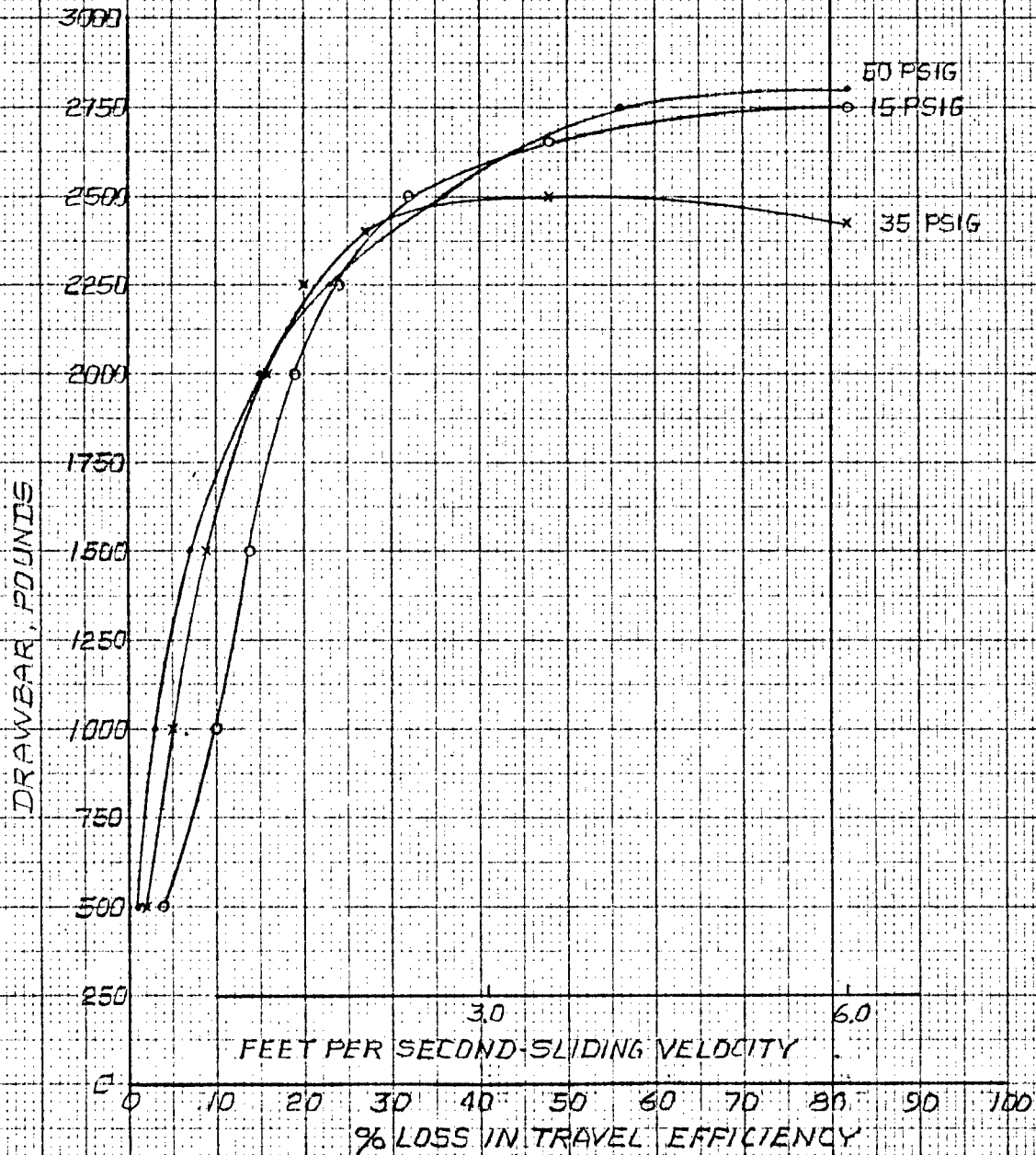
DYNAMIC TRACTION
VIRGIN SNOW
600HP-B RUN NO. 3
FIGURE NO. 50

Location WEST YELLOWSTONE

Date 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 9°F
SNOW TEMP. 6°F
MOISTURE CONTENT: 14-17%



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

VIRGIN SNOW

GROUP B RUN NO. 4

FIGURE NO. 51

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: G S

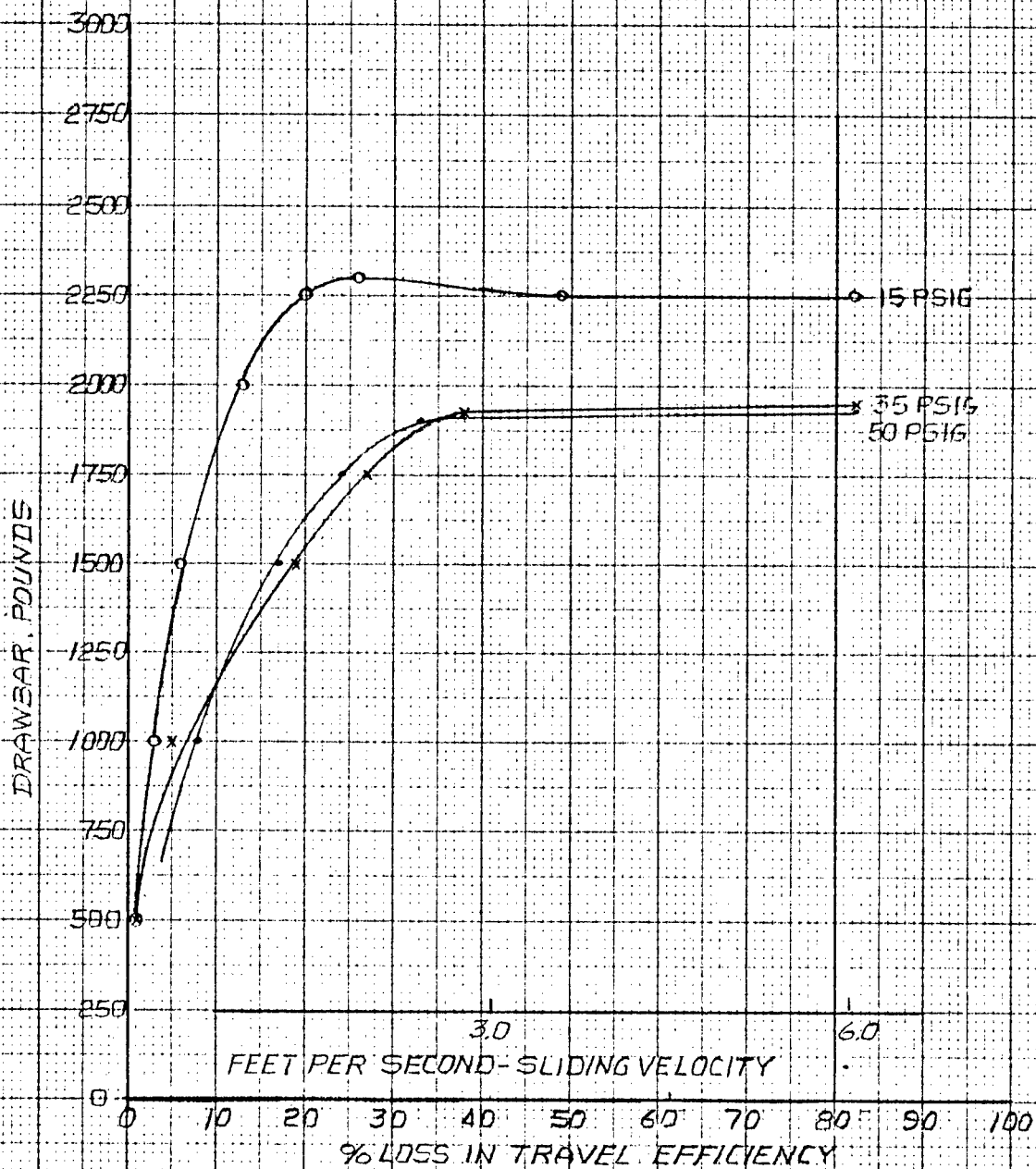
Data By: JED

4 WHEEL DRIVE

AMB. TEMP. 11°F

SNOW TEMP. 10°F

MOISTURE CONTENT: 10-17%



Nevada Automotive Test Center

Project: 20-17-30

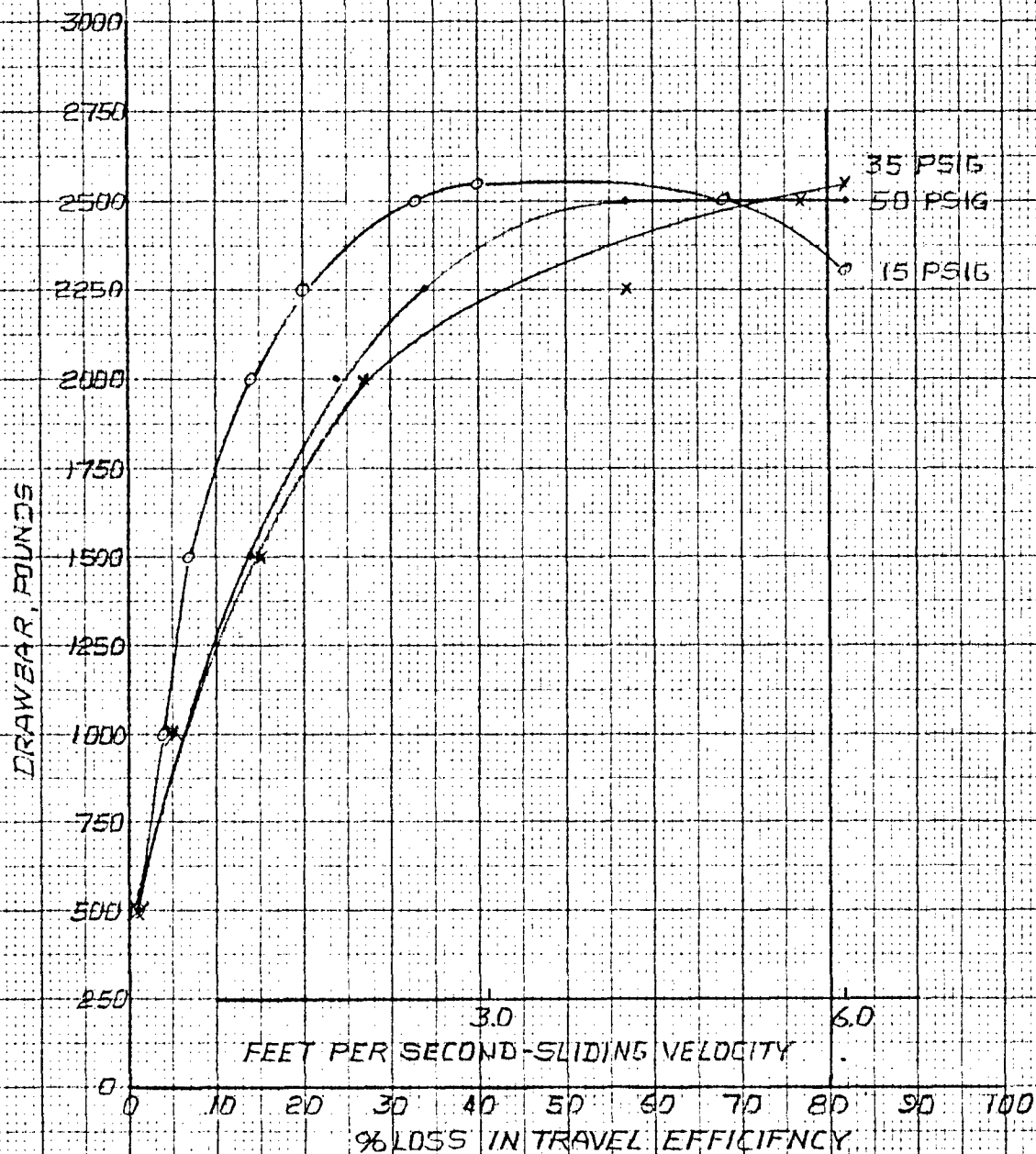
DYNAMIC TRACTION
VIRGIN SNOW
GROUP E RUN NO. 5
FIGURE NO. 52

Location: WEST YELLOWSTONE

Date: 2-8/9-73 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 11°F
SNOW TEMP. 10°F
MOISTURE CONTENT: 14-17%



Nevada Automotive Test Center

Project: 20-17-30

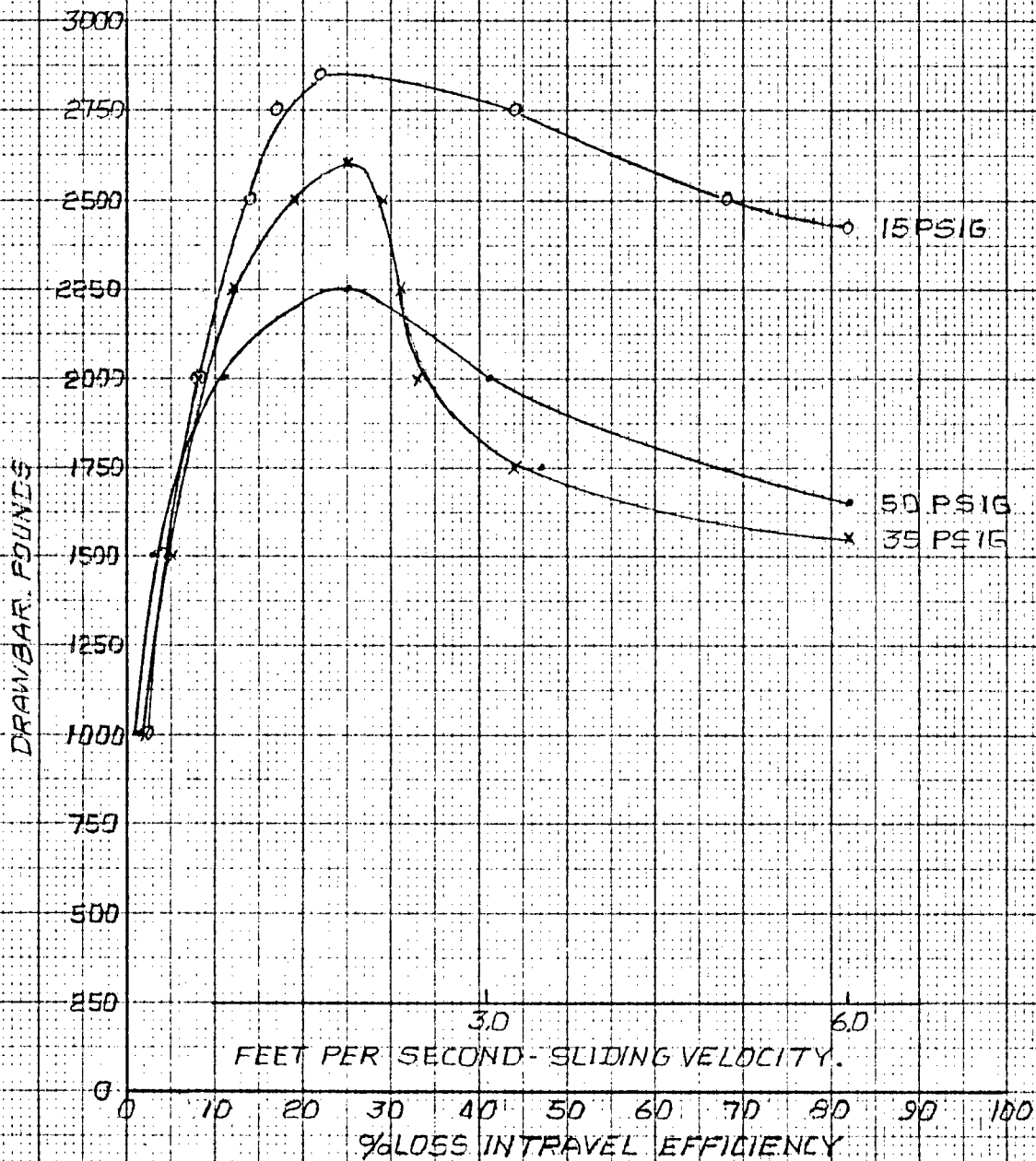
DYNAMIC TRACTION
VIRGIN SNOW
GROUP F RUN NO. 6
FIGURE NO. 53

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4WHEEL DRIVE
AMB. TEMP. 19°F
SNOW TEMP. 18°F
MOISTURE CONTENT: 14-17%



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

VIRGIN SNOW

GROUP G RUN NO. 7

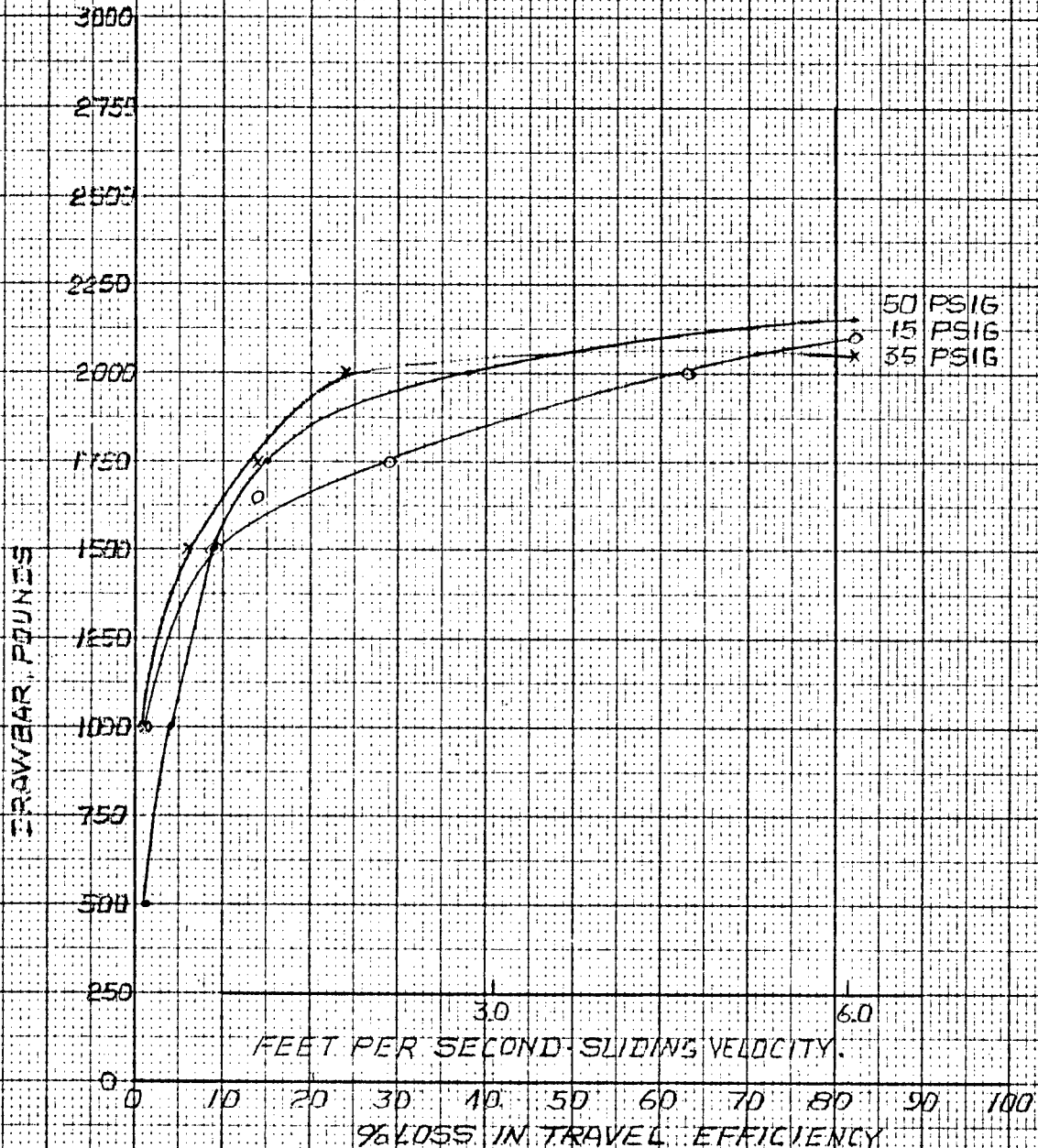
FIGURE NO. 54

Location: WEST YELLOWSTONE

Date: 2-8/5-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 25°F
SNOW TEMP. 21°F
MOISTURE CONTENT: 11.7%



Nevada Automotive Test Center

Project: 20-17-30

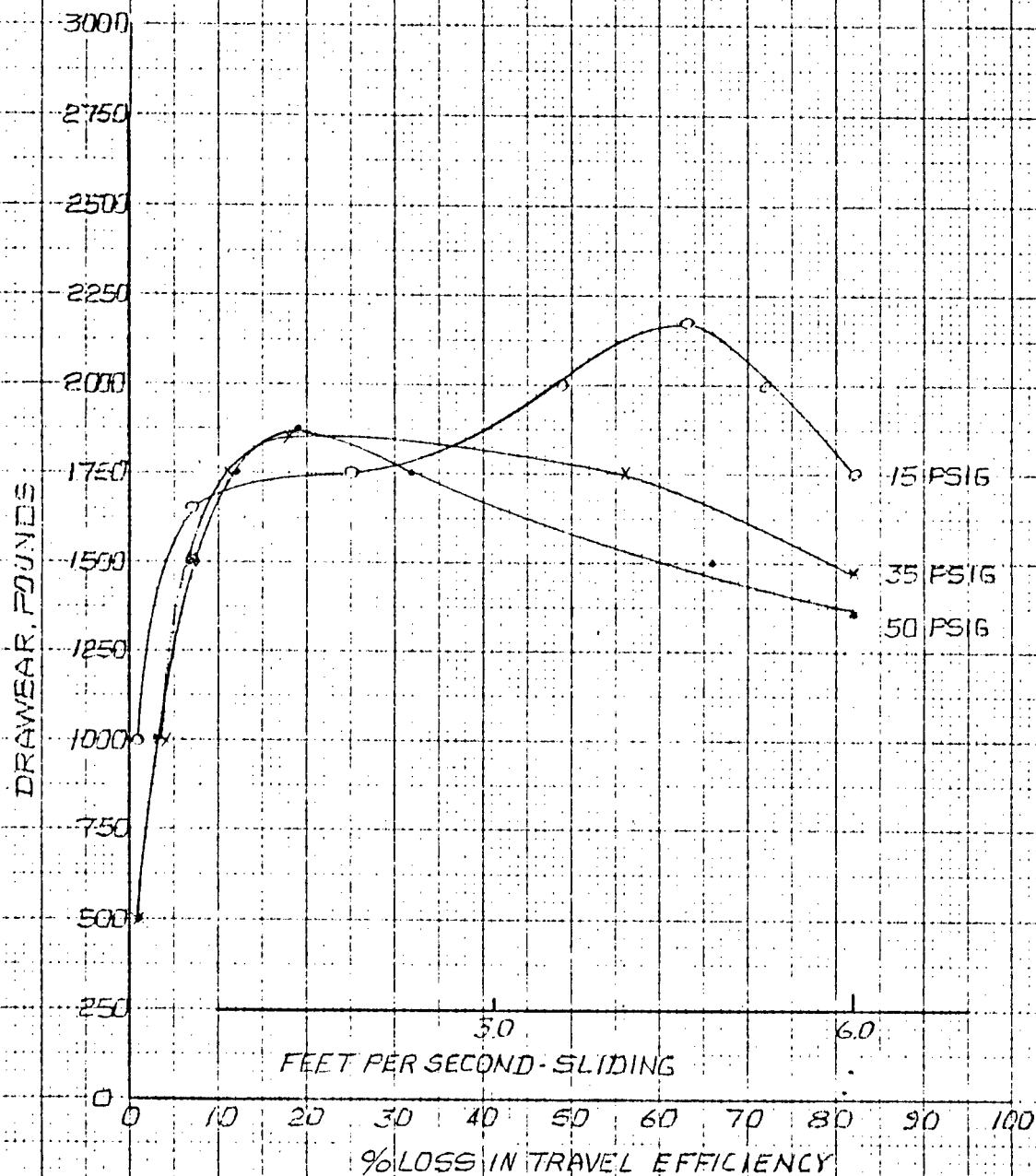
DYNAMIC TRACTION
VIRGIN SNOW
GRAPH J RUN NO. 8
FIGURE NO. 55

Location: WEST YELLOWSTONE

Date: 2-8/8-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 20°F
SNOW TEMP. 21°F
MOISTURE CONTENT: 14-17%



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
VIRGIN SNOW
GROUP C RUN NO. 9
FIGURE NO. 56

Location: WEST YELLOWSTONE

Date: 2/8/9-74 Test By: GS

Data By: JED

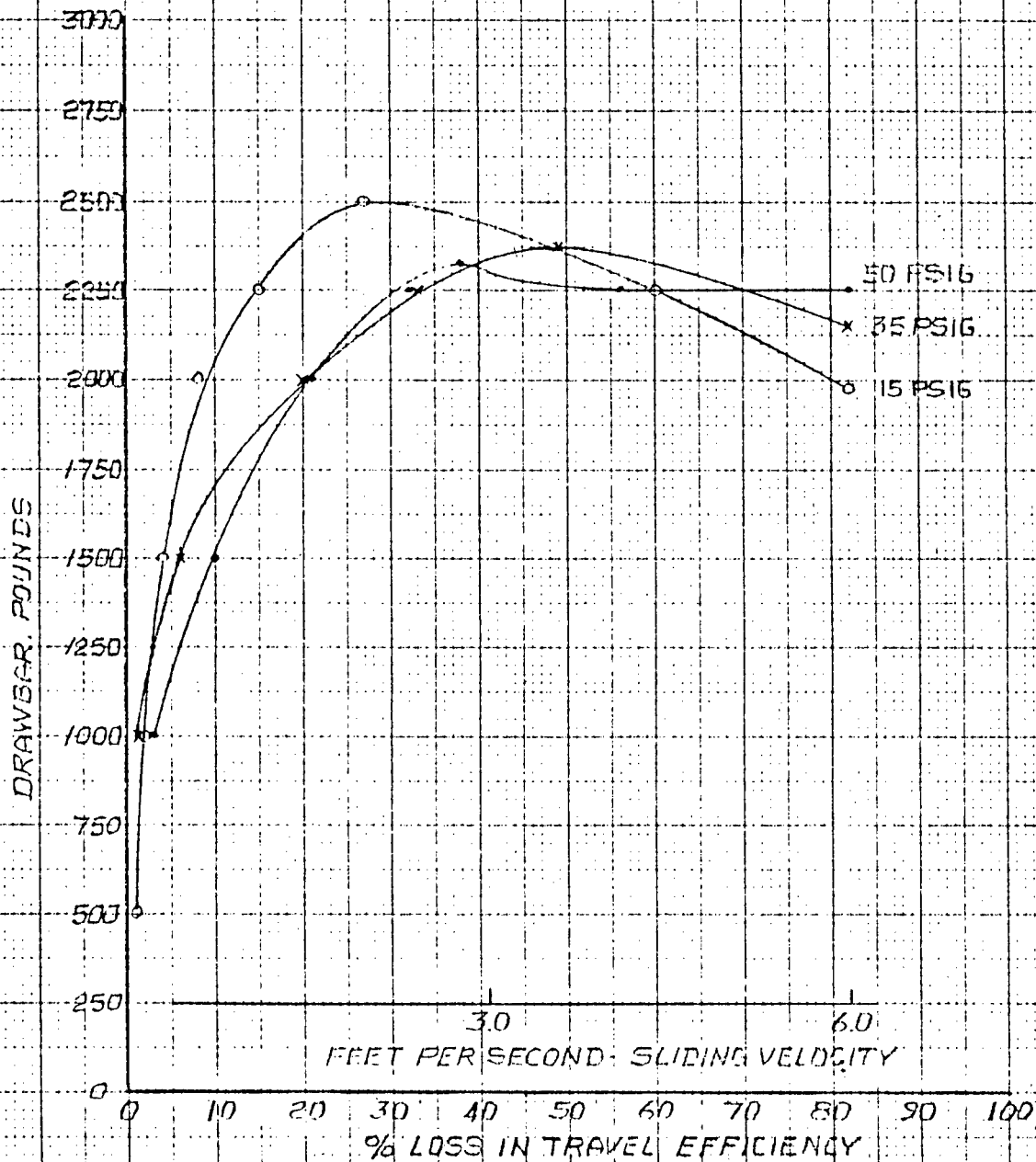
SECOND RUN

4 WHEEL DRIVE

AMB. TEMP. 20°F

SNOW TEMP. 22°F

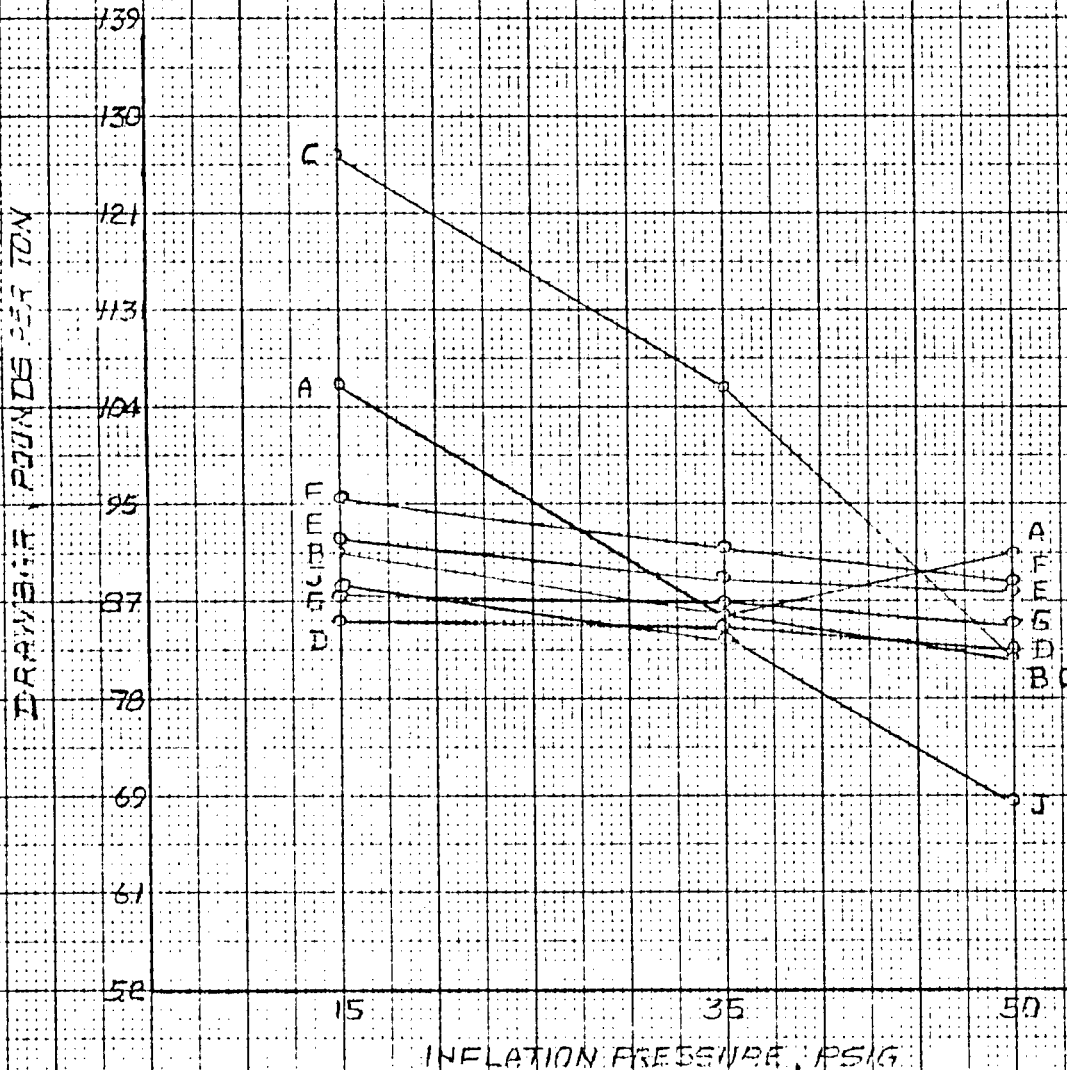
MOISTURE CONTENT: 14-17%



TEST DATA

Figure No. 57

Rolling Resistance - Virgin Snow

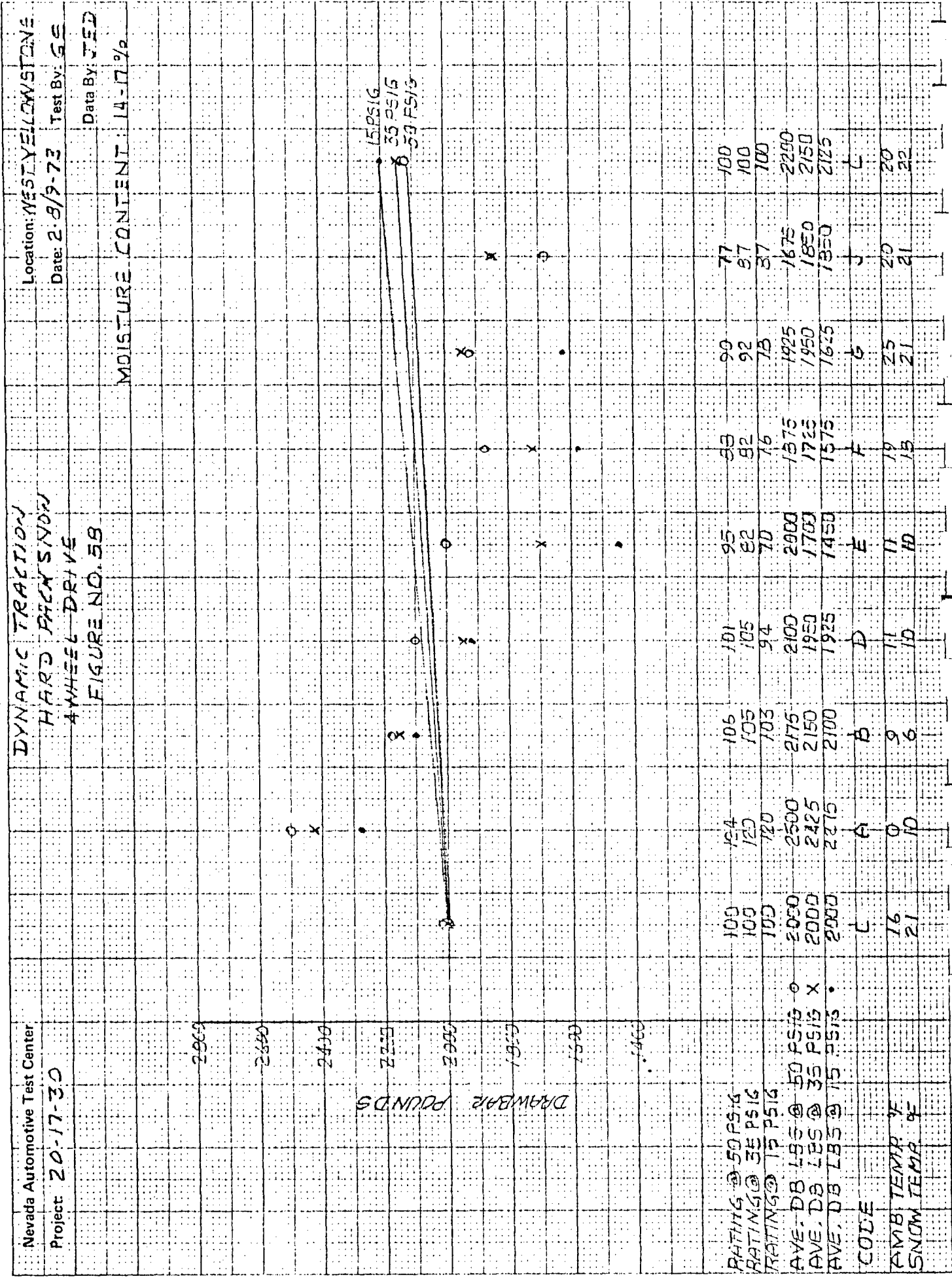


GROUP	POUNDS PER TON	%	POUNDS PER TON	%	POUNDS PER TON	%
C	128	100	106	100	91	100
A	106	116	85	119	91	88
B	91	128	85	119	91	100
D	85	133	85	120	92	95
E	92	127	85	115	88	92
F	94	124	82	113	88	91
G	87	131	84	118	85	96
J	88	131	84	121	69	115

TEST DATA

Figure No. 58

Dynamic Traction Summary - Hard Pack Show



TEST DATA

Figure Nos. 59 through 67

Dynamic Traction - Hard Pack Snow

Nevada Automotive Test Center

Project: 20-17-30

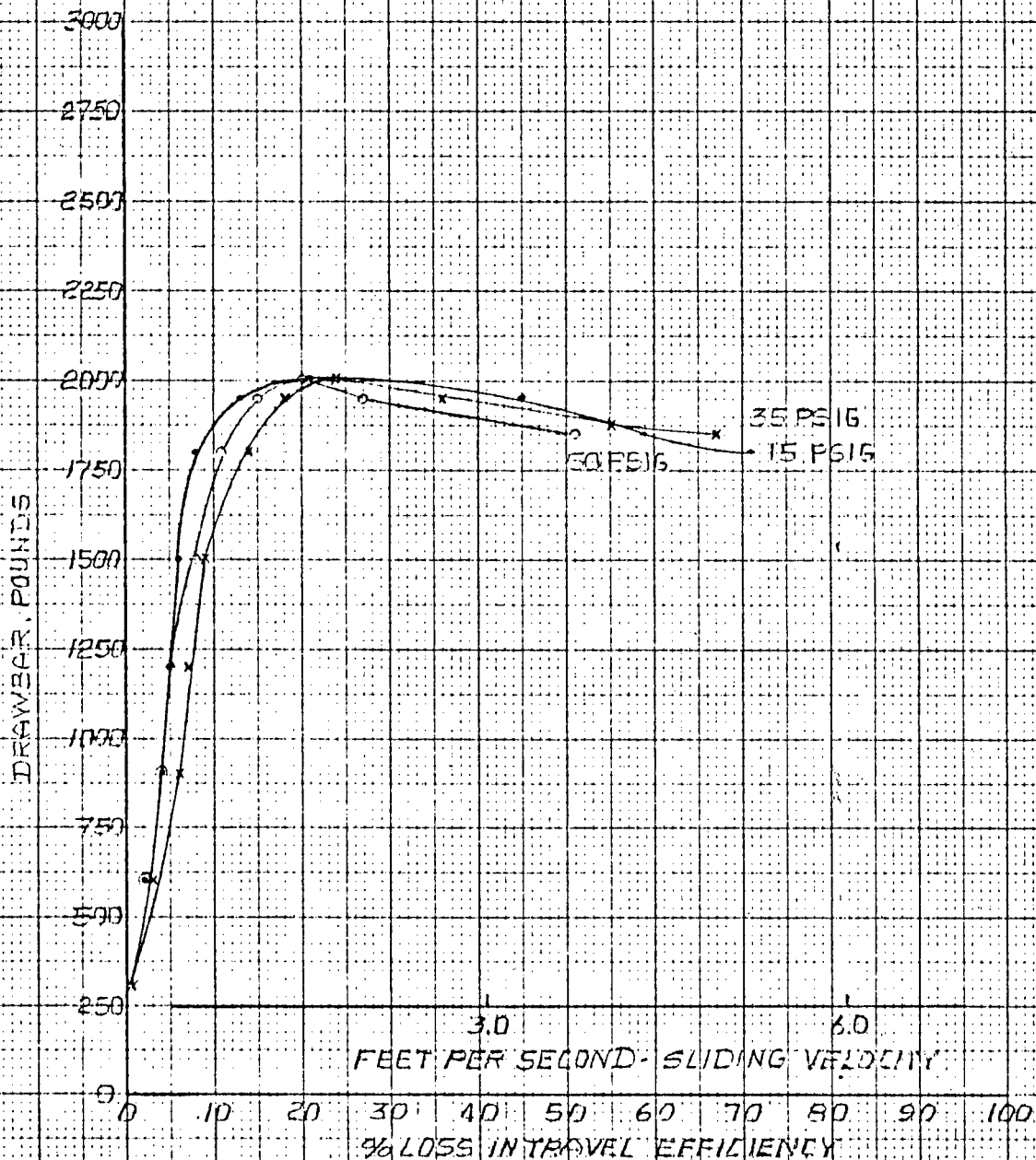
DYNAMIC TRACTION
HARD PACK SNOW
6 PSI G - RUN NO. 1
FIGURE NO. 59

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

FIRST RUN
4 WHEEL DRIVE
AMB. TEMP. 16°F
SNOW TEMP. 21°F
MOISTURE CONTENT: 14-17%



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

HARD PACK SNOW

GROUP 4 RUN NO. 2

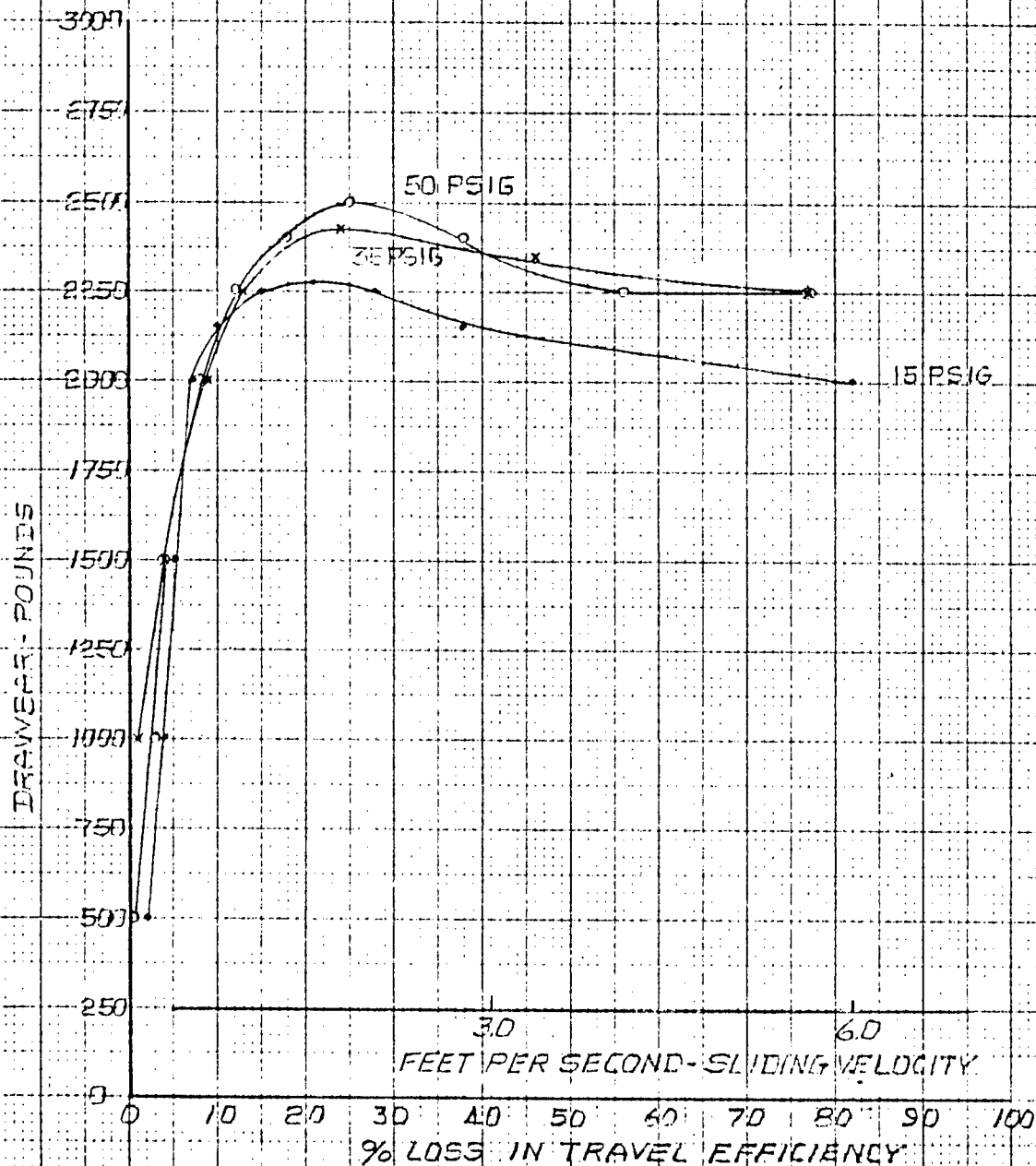
FIGURE NO. 60

Location: WEST YELLOWSTONE

Date: 2-28-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 0°F
SNOW TEMP. 10°F
MOISTURE CONTENT 14-17%



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

HARD PACK SNOW

GROVE B. RUN 110.3

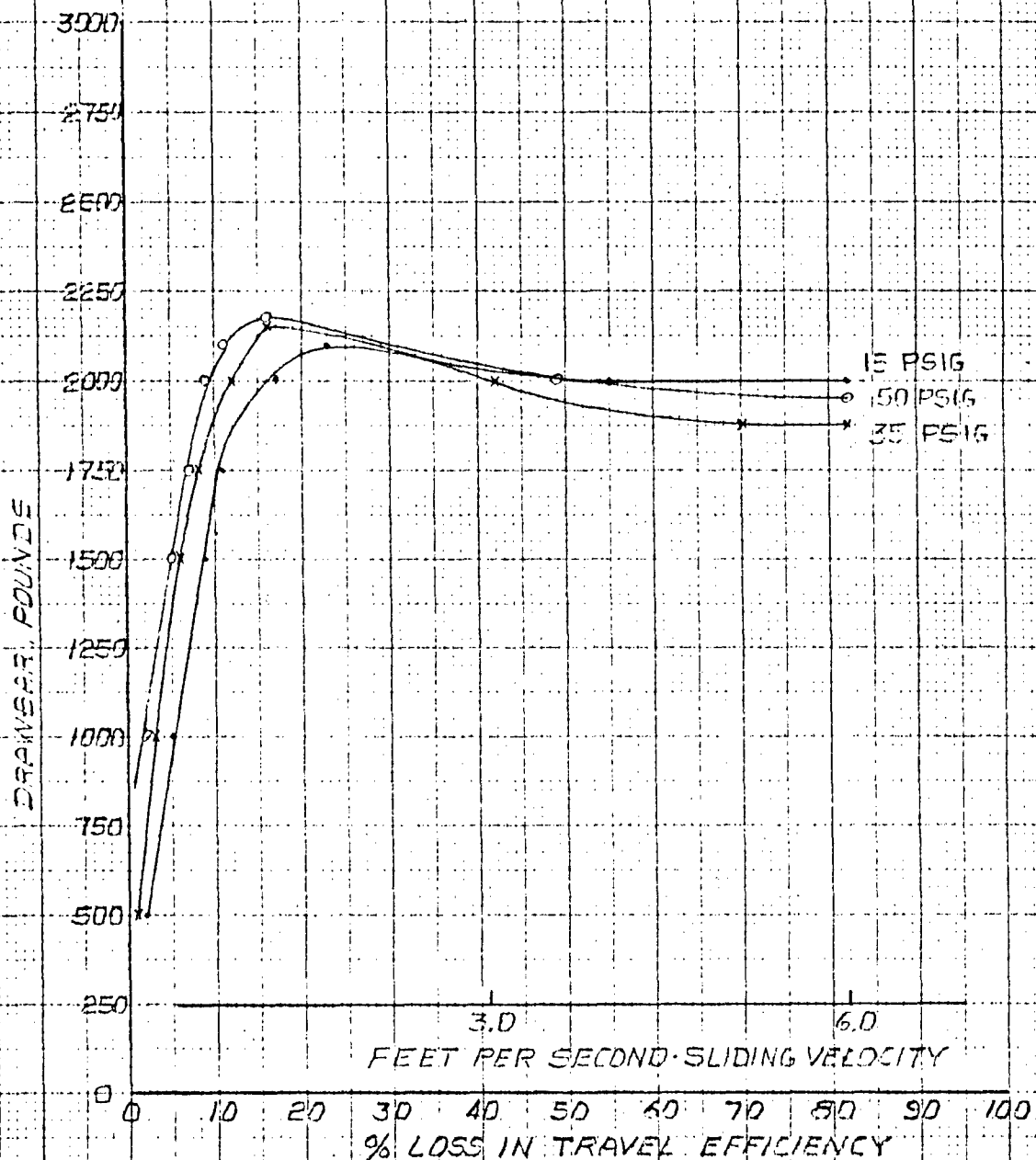
FIGURE NO. 61

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 9°F
SNOW TEMP. 6°F
MOISTURE CONTENT: 14-17%



Nevada Automotive Test Center

Project: 20-17-39

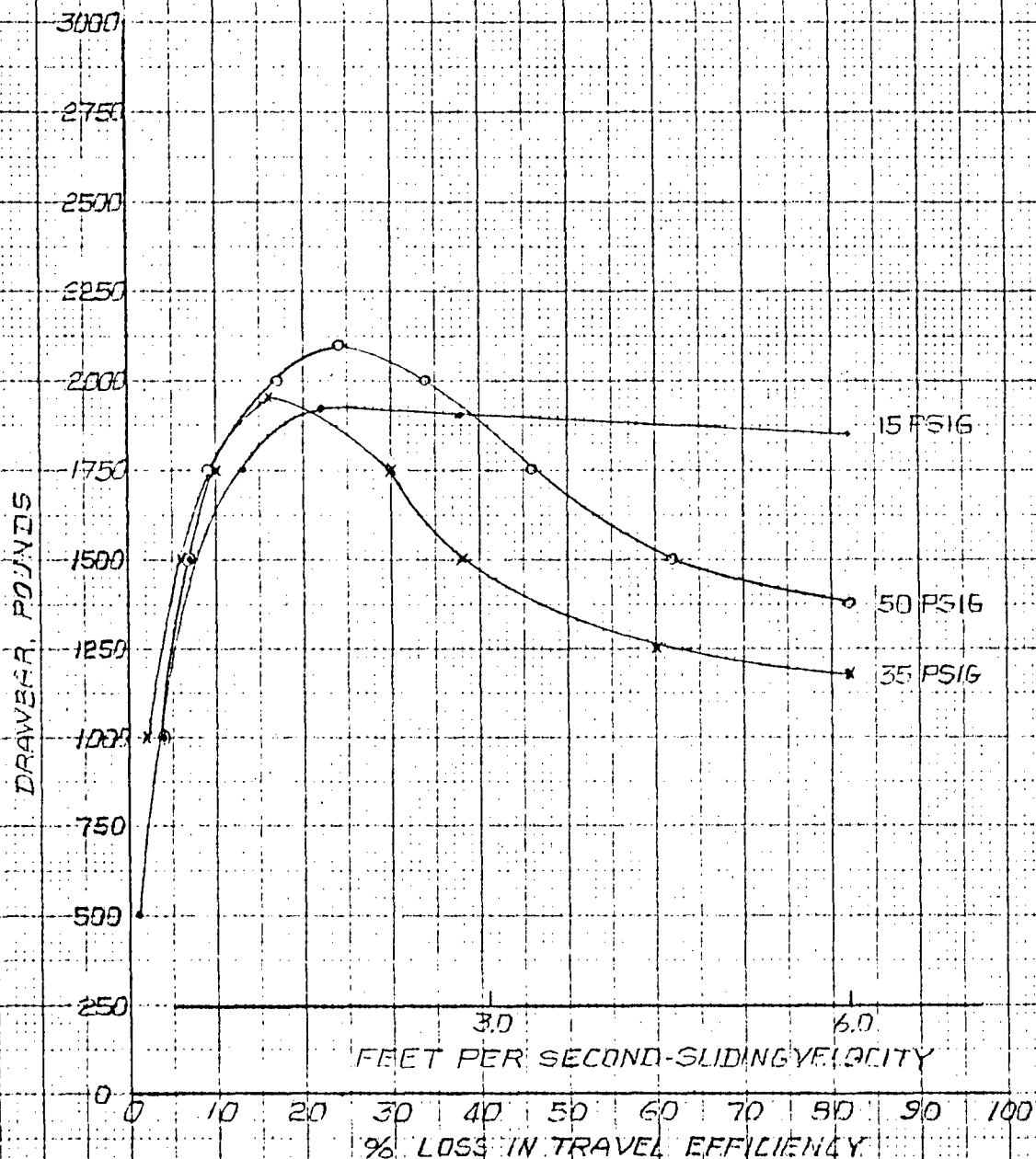
DYNAMIC TRACTION
HARD PACK SNOW
GROUP D-RUN NO. 4
FIGURE NO. 62

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 11°F
SNOW TEMP. 10°F
MOISTURE CONTENT: 14-17%



Nevada Automotive Test Center

Project: 20-17-30

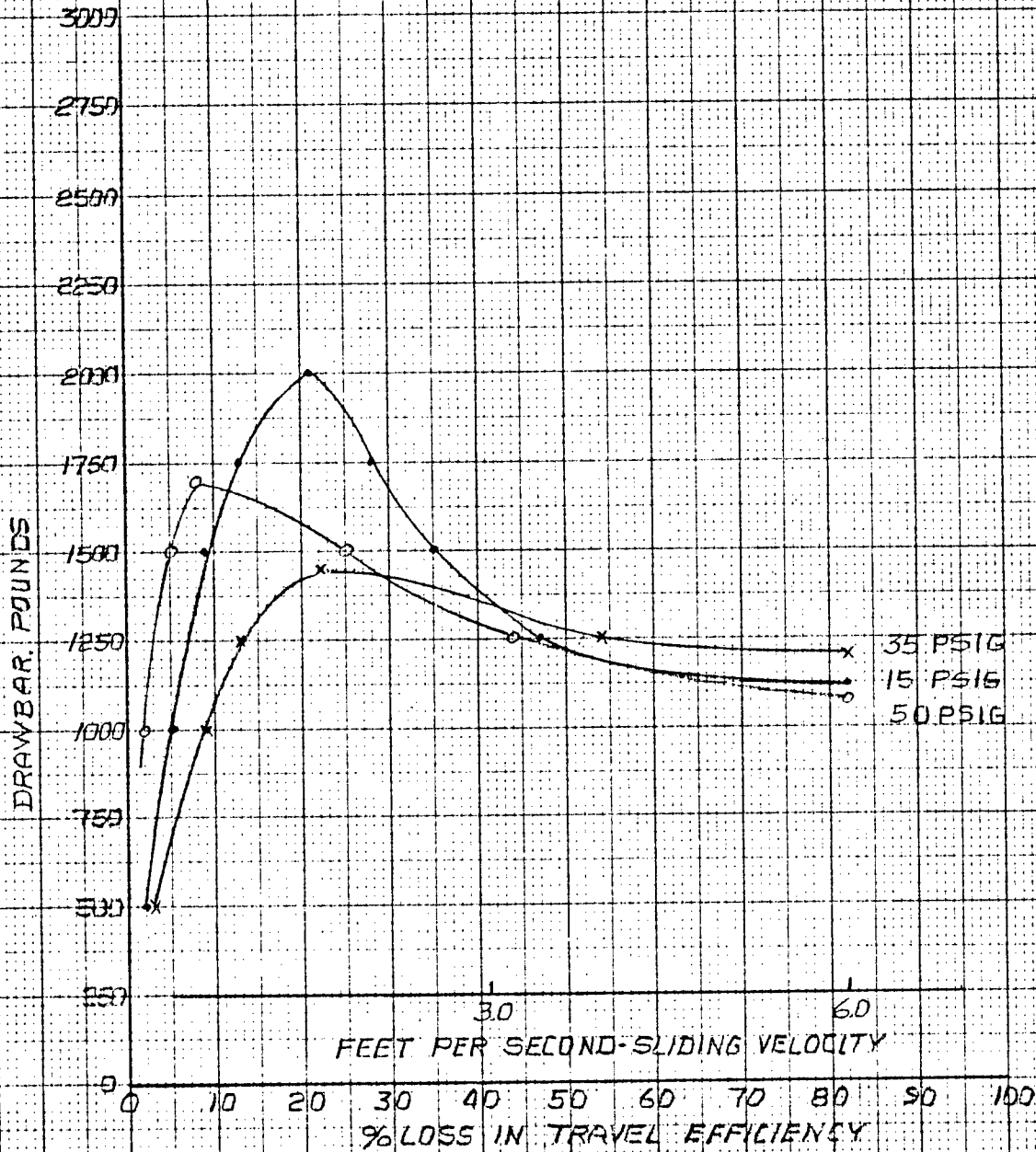
DYNAMIC TRACTION
HARD PACK SNOW
GROUP E RUN NO. 5
FIGURE NO. 63

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 11°F
SNOW TEMP 10°F
MOISTURE CONTENT 14-17%



Nevada Automotive Test Center

Project: 201-17-30

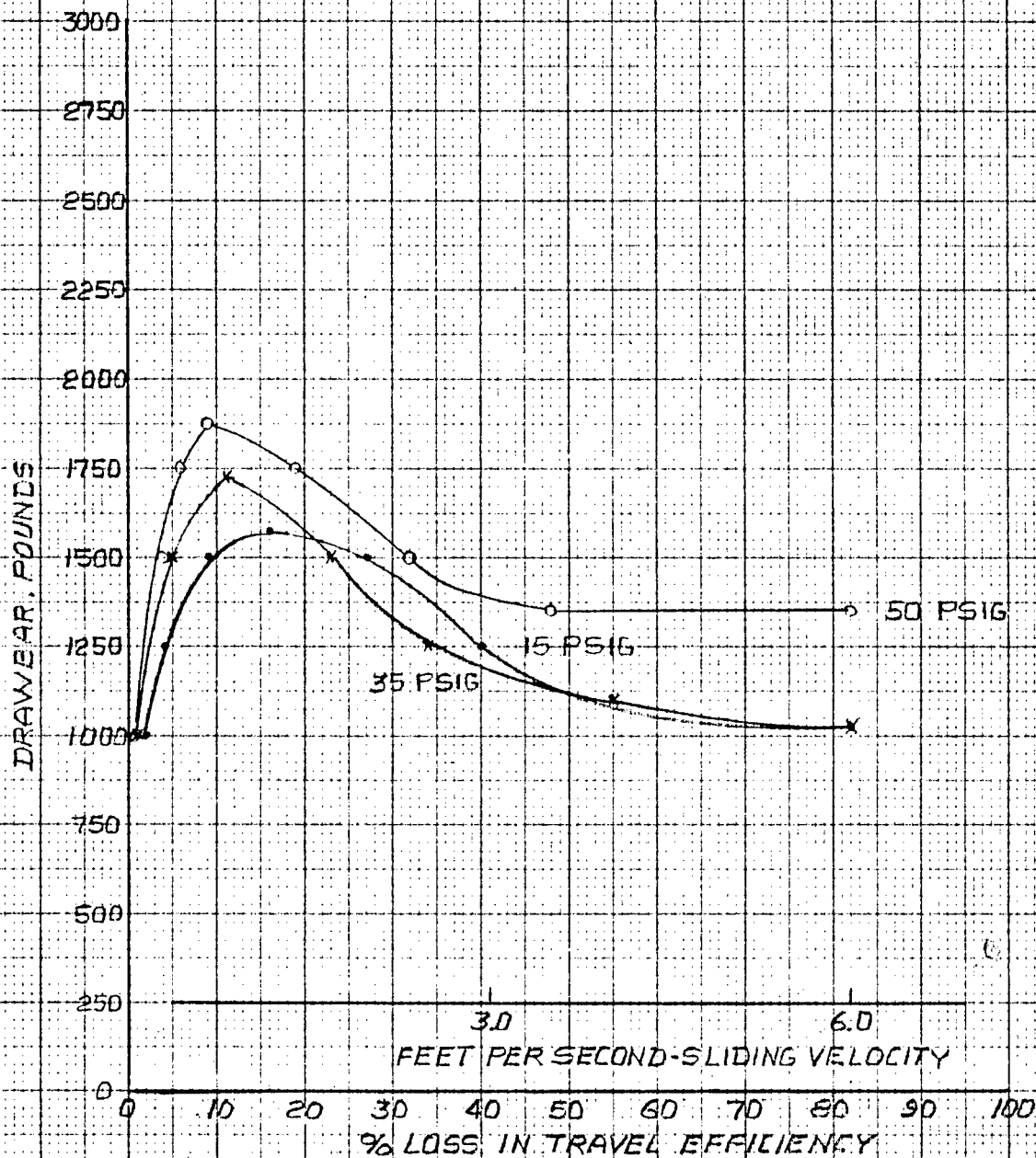
DYNAMIC TRACTION
HARE PACK SNOW
GROUP F RUN NO. 6
FIGURE NO. 64

Location: WEST YELLOWSTONE

Date: 2-8-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 19°F
SNOW TEMP. 18°F
MOISTURE CONTENT: 14.17%



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION

HARD PACK SNOW

GROUP G RUN NO. 7

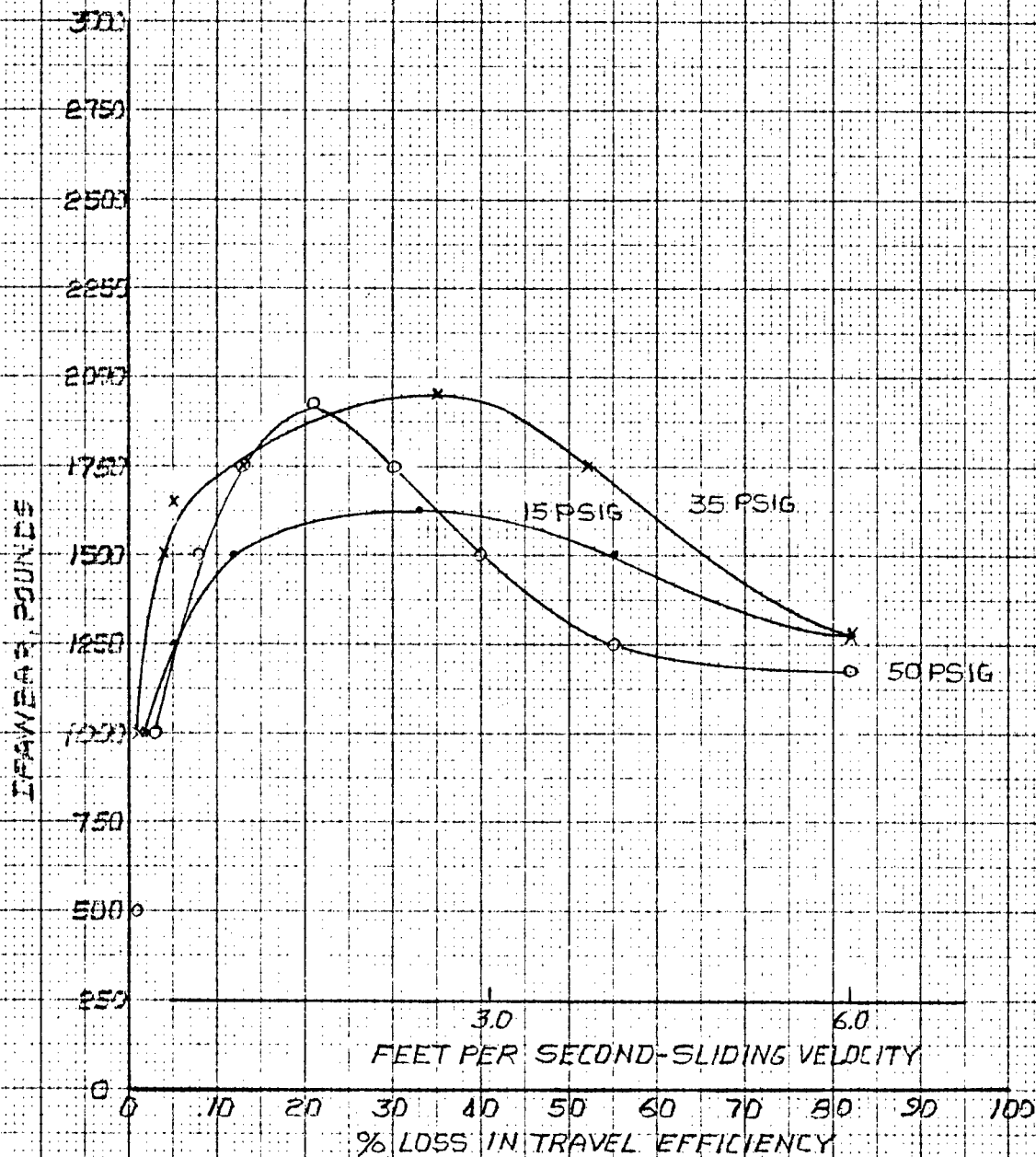
FIGURE NO. 65

Location: WEST YELLOWSTONE

Date: 2-8-9-74 Test By: GS

Date By: JED

4 WHEEL DRIVE
AMB. TEMP. 25°F
SNOW TEMP. 21°F
MOISTURE CONTENT: 14-17%



Nevada Automotive Test Center

Project: 20-17-30

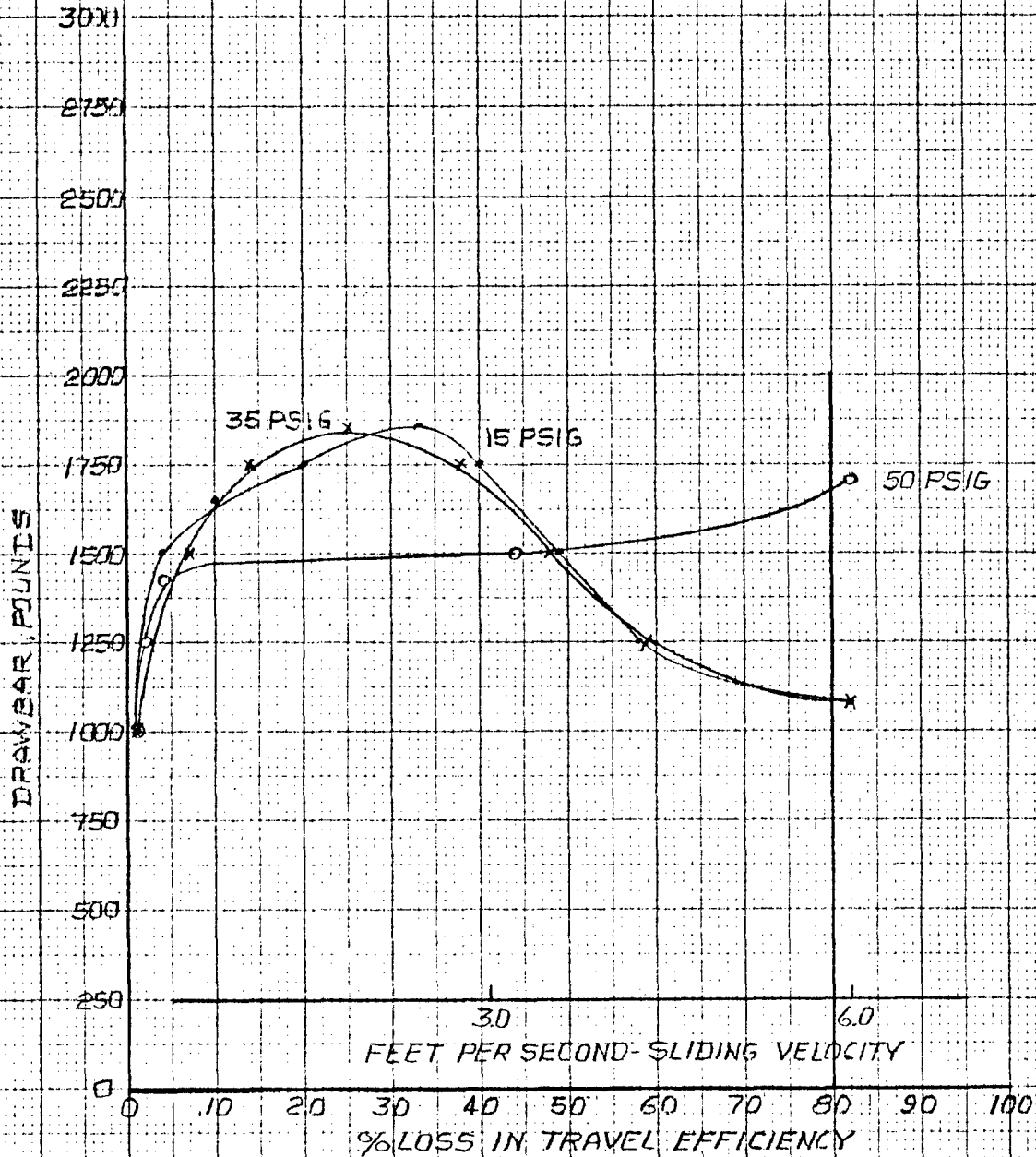
DYNAMIC TRACTION
HARD PACK SNOW
GROUP J - RUN NO. 8
FIGURE NO. 66

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

4 WHEEL DRIVE
AMB. TEMP. 20°F
SNOW TEMP 21°F
MOISTURE CONTENT: 14.17%



Nevada Automotive Test Center

Project 20-17-30

DYNAMIC TRACTION
HARD PACK SNOW
GROUP C - RUN NO. 9
FIGURE NO. 67

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: GS

Data By: JED

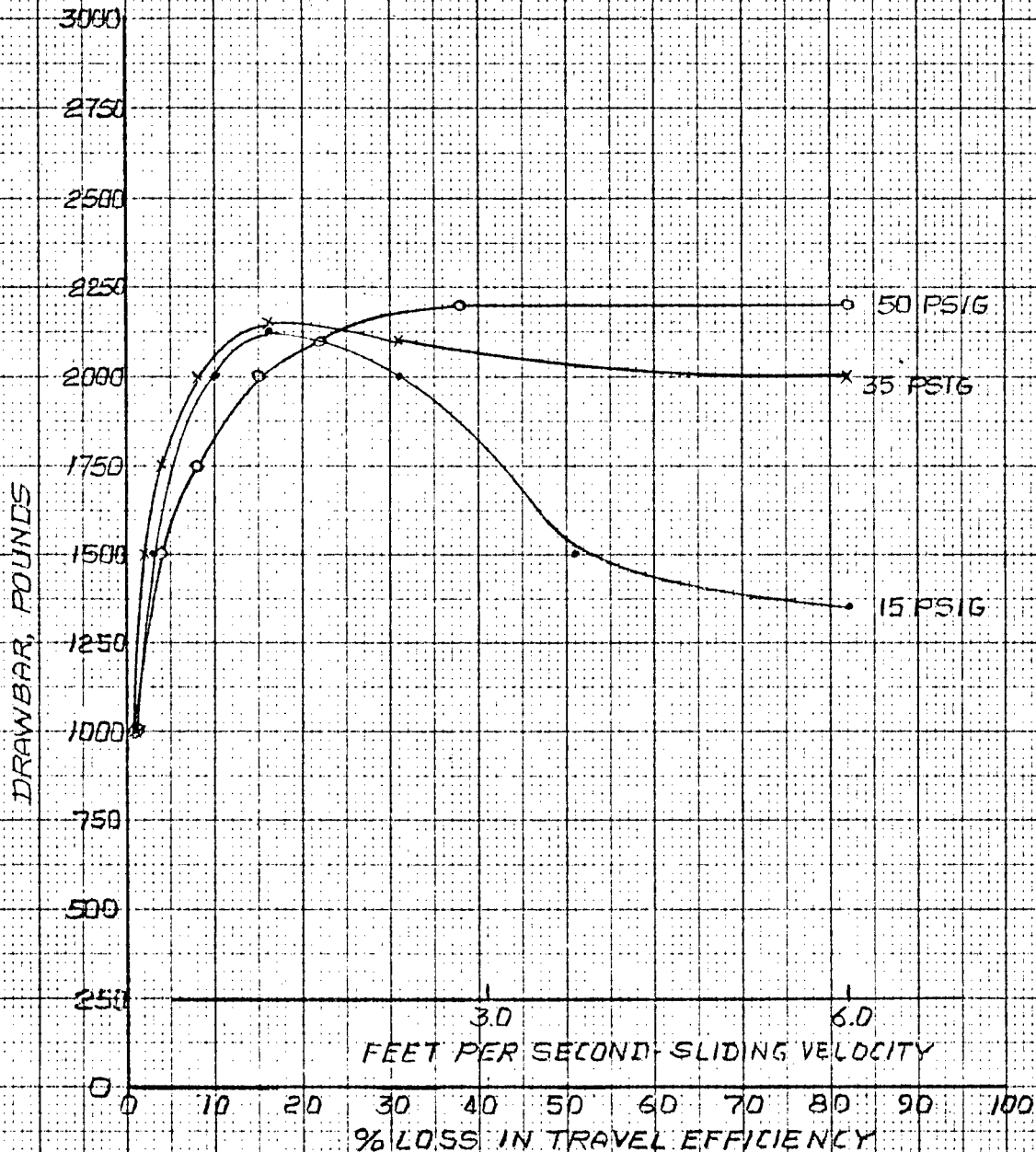
SECOND RUN

4 WHEEL DRIVE

A.M.B. TEMP 20°F

SNOW TEMP 22°F

MOISTURE CONTENT 14-17%



TEST DATA

Figure No. 68

Rolling Resistance - Hard Pack Snow

Nevada Automotive Test Center

Project: 20-17-30

ROLLING RESISTANCE

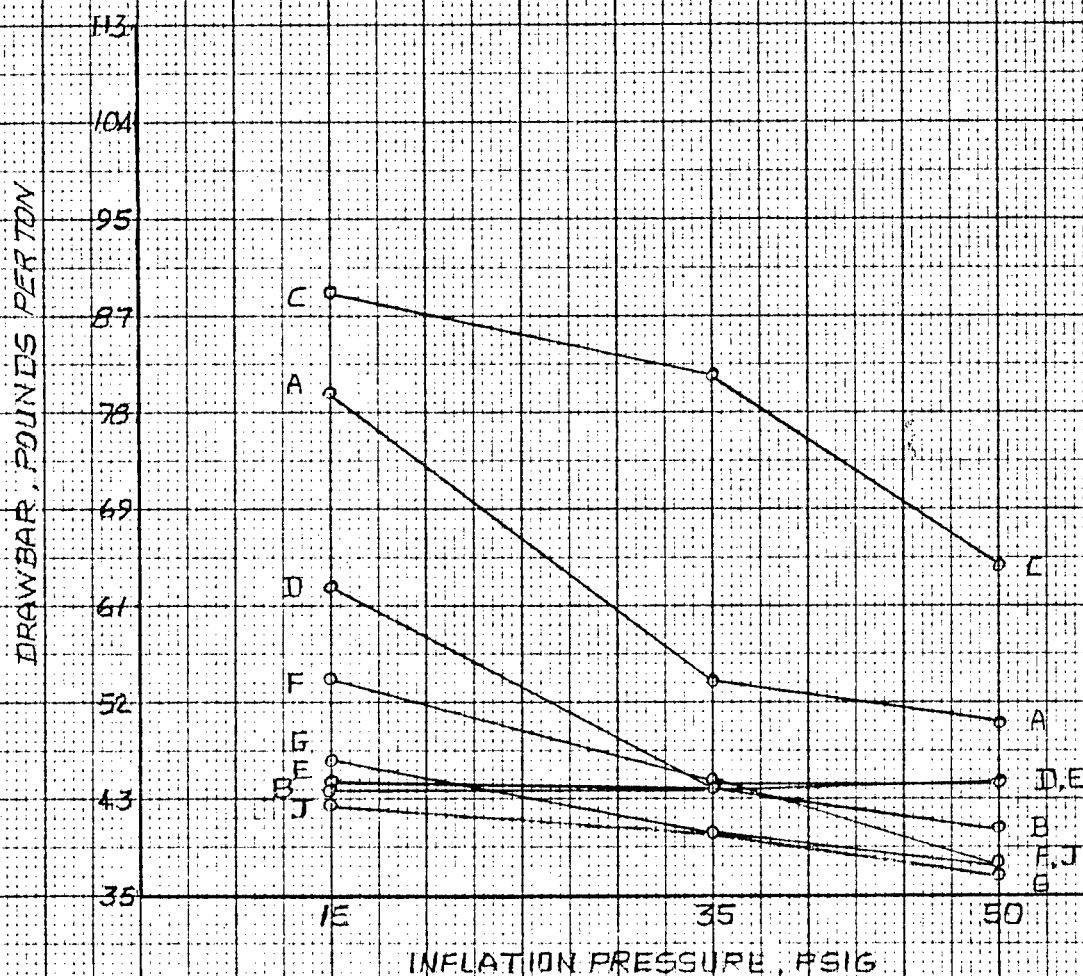
PACKED SNOW

FIGURE NO. 68

Location: WEST YELLOWSTONE

Date: 2-8/9-74 Test By: G S

Data By: JED



GROUP	15 PSIG		35 PSIG		50 PSIG	
	POUNDS PER TON	%	POUNDS PER TON	%	POUNDS PER TON	%
C	89	100	81	100	64	100
A	80	110	54	134	49	122
B	45	150	44	146	41	136
D	62	130	45	143	45	130
E	44	150	44	146	45	130
F	54	139	45	144	37	142
G	47	147	40	150	36	143
J	43	152	40	150	37	141

TEST DATA

Figure No. 69

Dynamic Traction Summary - Wet Asphalt

Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
WET ASPHALT
4 WHEEL DRIVE

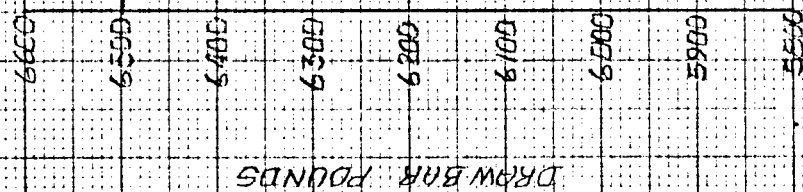
FIGURE NO. 69

Location: PROVING GROUND

Date: 11-9-73

Test By: WHS

Data By:	JED
----------	-----



RATING % ③ 50 PSIG
RATING % ③ 35 PSIG
RATING % ③ 15 PSIG

AVE. DE L'ES @ 50 PSIG •
AVE. DE L'ES @ 35 PSIG X
AVE. DE L'ES @ 15 PSIG Δ

WDB

[illegible]

WESTON LIMO

TEST DATA

Figure Nos. 70 through 79

Dynamic Traction - Wet Asphalt

Nevada Automotive Test Center

Project 20-17-30

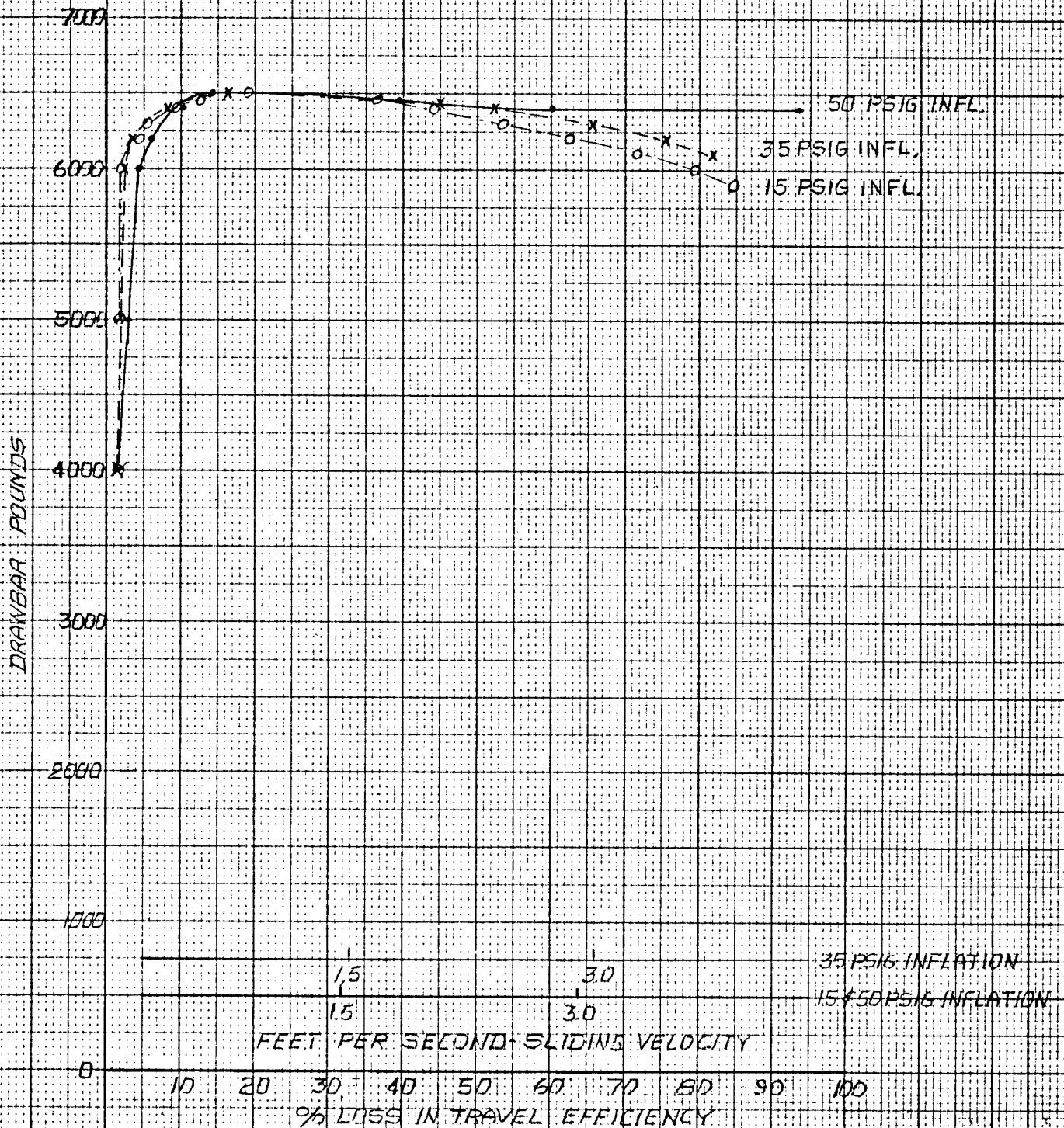
DYNAMIC TRACTION
WET ASPHALT
GROUP C RUN NO. 1
FIGURE NO. 70

Location: PROVING GROUND

Date: 11-9-73 Test By: WHS

Data By: WHS

AMB. TEMP. RANGE 52°F
SURF. TEMP. RANGE 52°F



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
WET ASPHALT

GROUP J RUN NO. 2

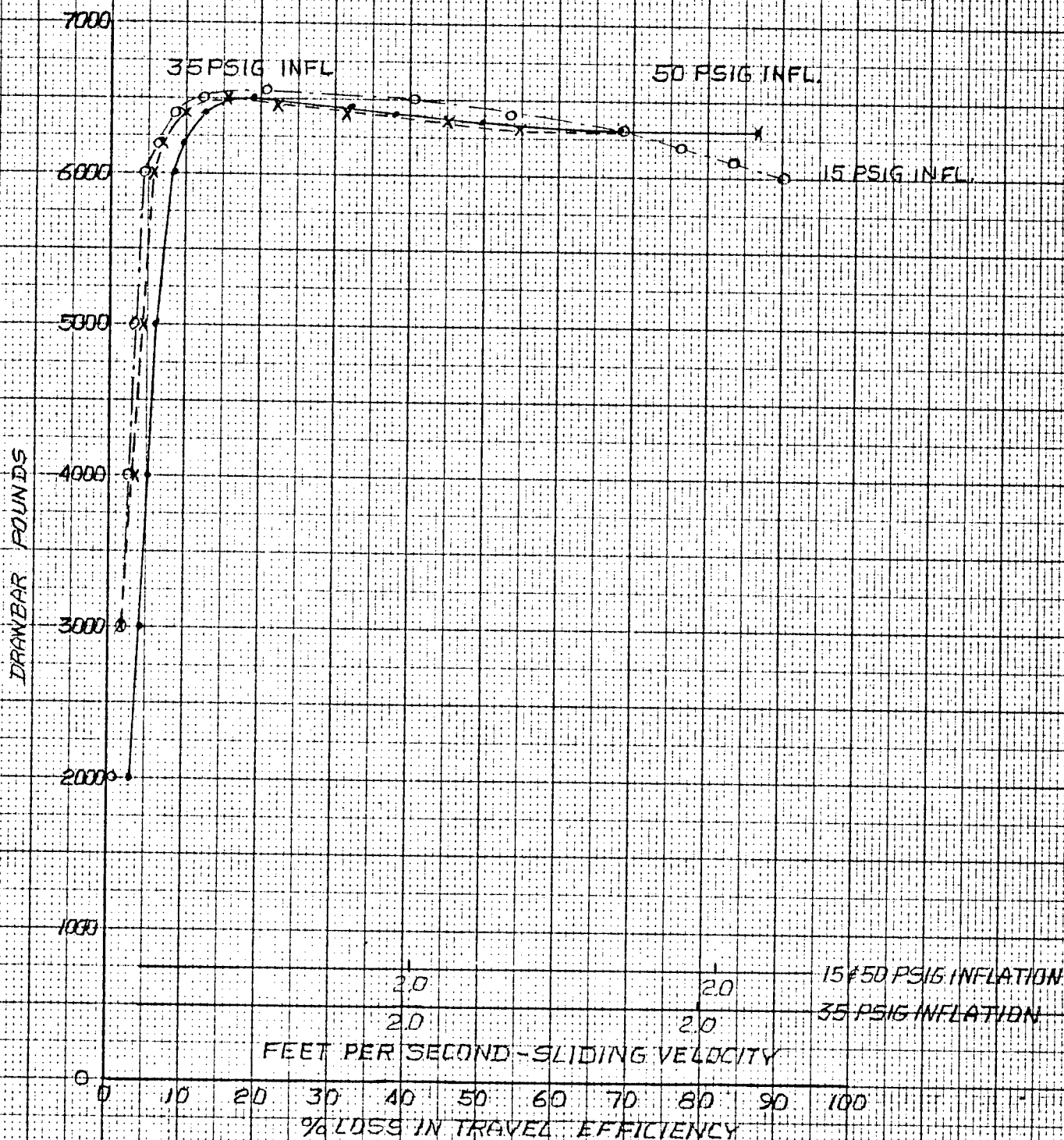
FIGURE NO. 71

Location: PROVING GROUND

Date: 11-9-73 Test By: WHS

Data By: WHS

AMB. TEMP. 70°F
SURF. TEMP. 58°F



Nevada Automotive Test Center

Project 20-7-30

DYNAMIC TRACTION
WET ASPHALT
GROUP G RUN NO. 3
FIGURE NO. 72

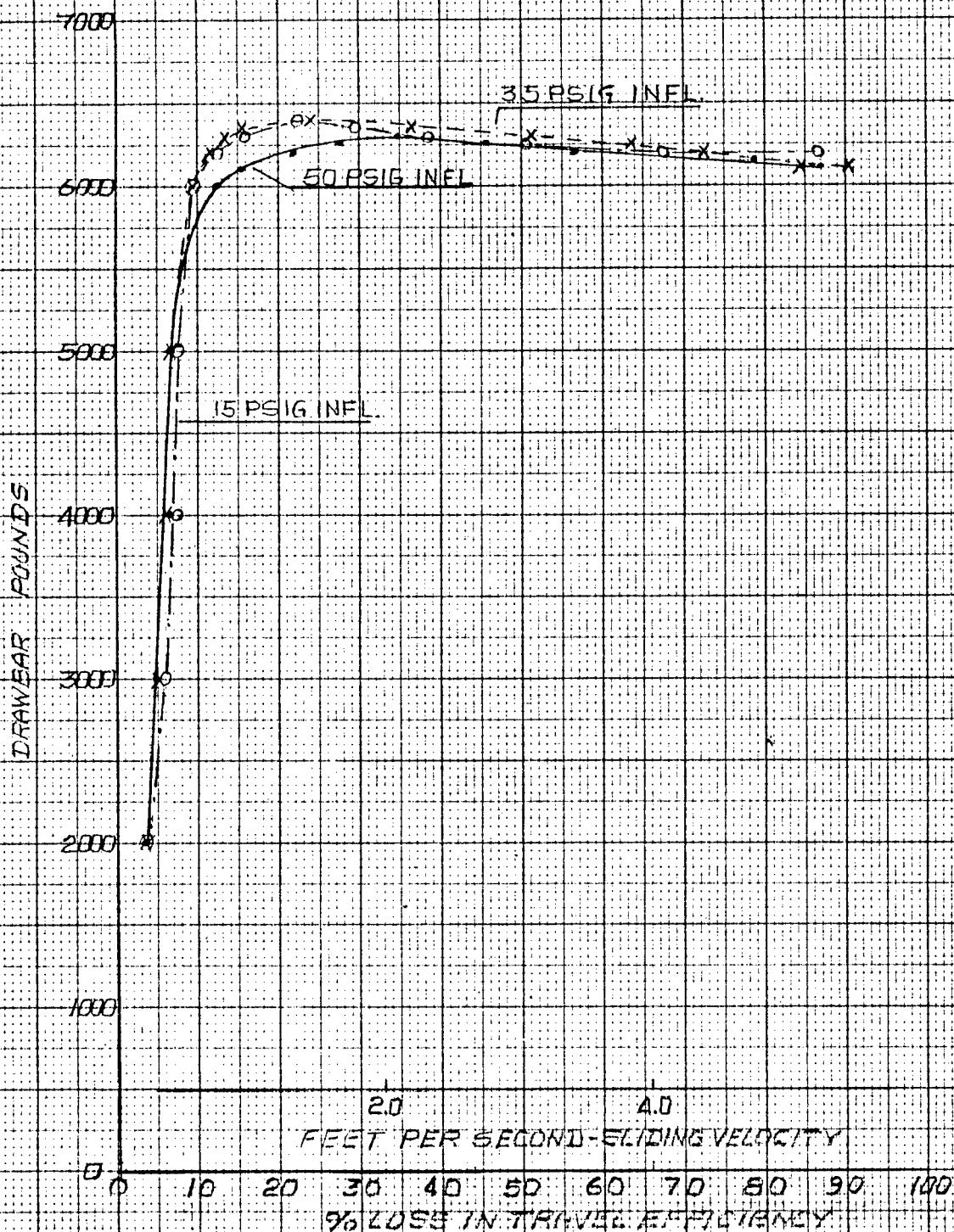
Location: PROVING GROUND

Date: 11-9-73

Test By: WHS

Data By: WHS

AIR TEMP 70°F
SURF TEMP 60°F



Nevada Automotive Test Center

Project 20-17-30

DYNAMIC TRACTION

WET ASPHALT

GROUP A RUN NO. 4

FIGURE NO. 73

Location: PROVING GROUND

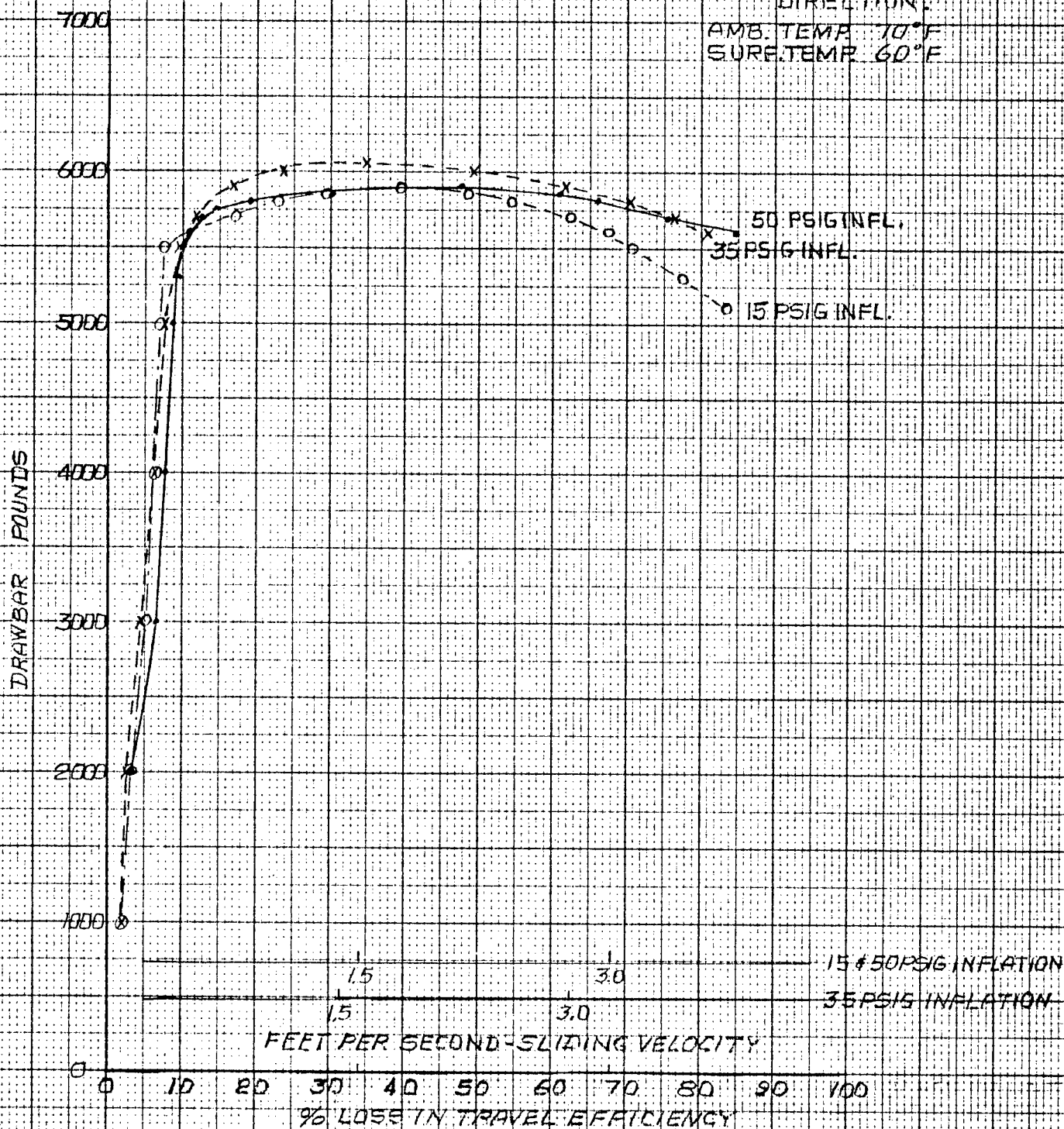
Date 11-9-73

Test By: WHS

Data By: WHS

NOTE: DIRECTIONAL TREAD
MOUNTED IN REVERSE
DIRECTION.

AMB. TEMP 70°F
SURE TEMP 60°F



Nevada Automotive Test Center

Project 20-17-30

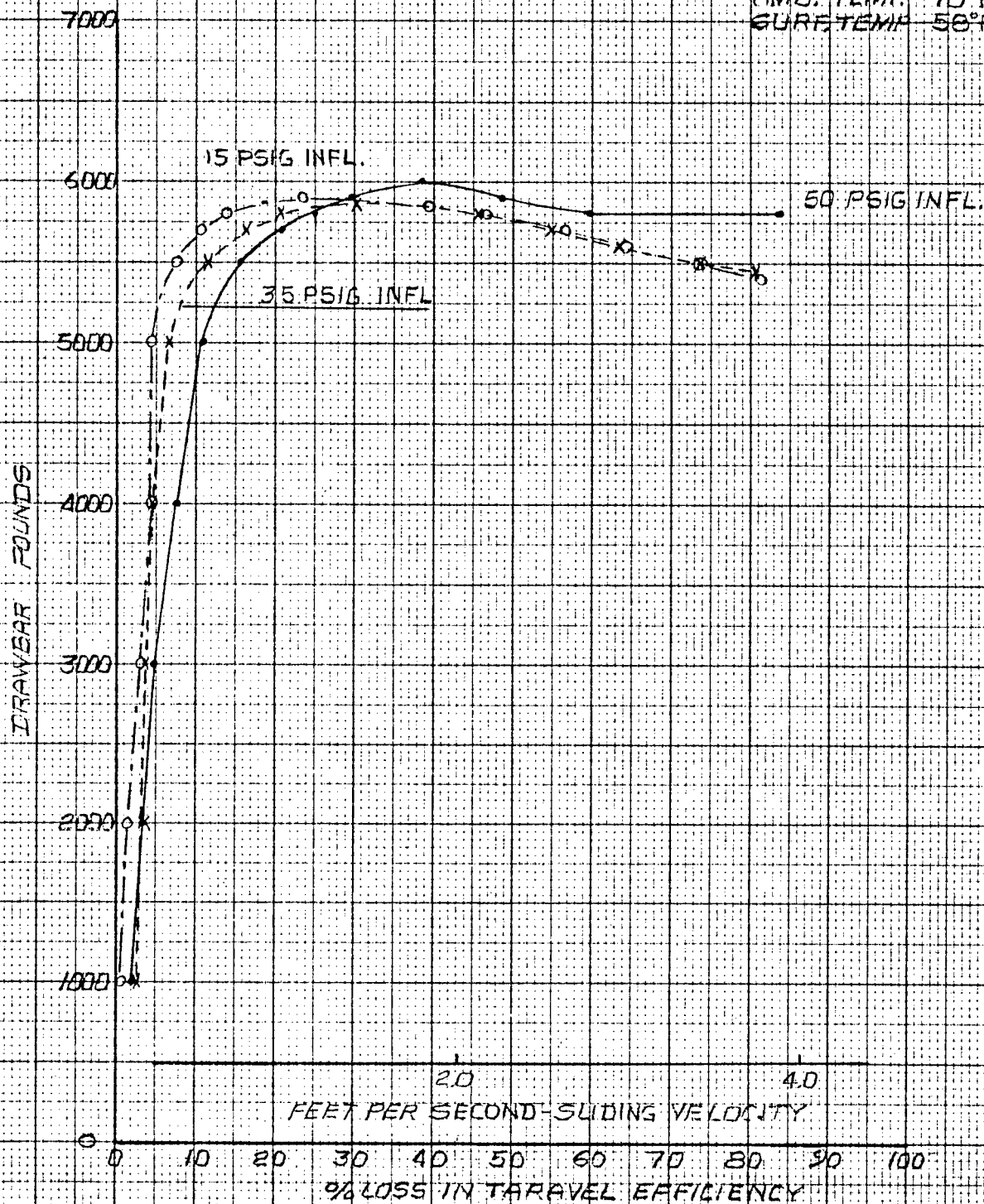
DYNAMIC TRACTION
WET ASPHALT
GROUP A RUN NO. 5
FIGURE NO. 74

Location: PROVINE GROUND

Date: 11-9-73 Test By: WHS

Data By: WHS

NOTE: DIRECTIONAL TREAD
IN CORRECT DIRECTION
AMB. TEMP 70°F
SURETEMP 58°F



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
WET ASPHALT

GROUP D RUN NO. 6

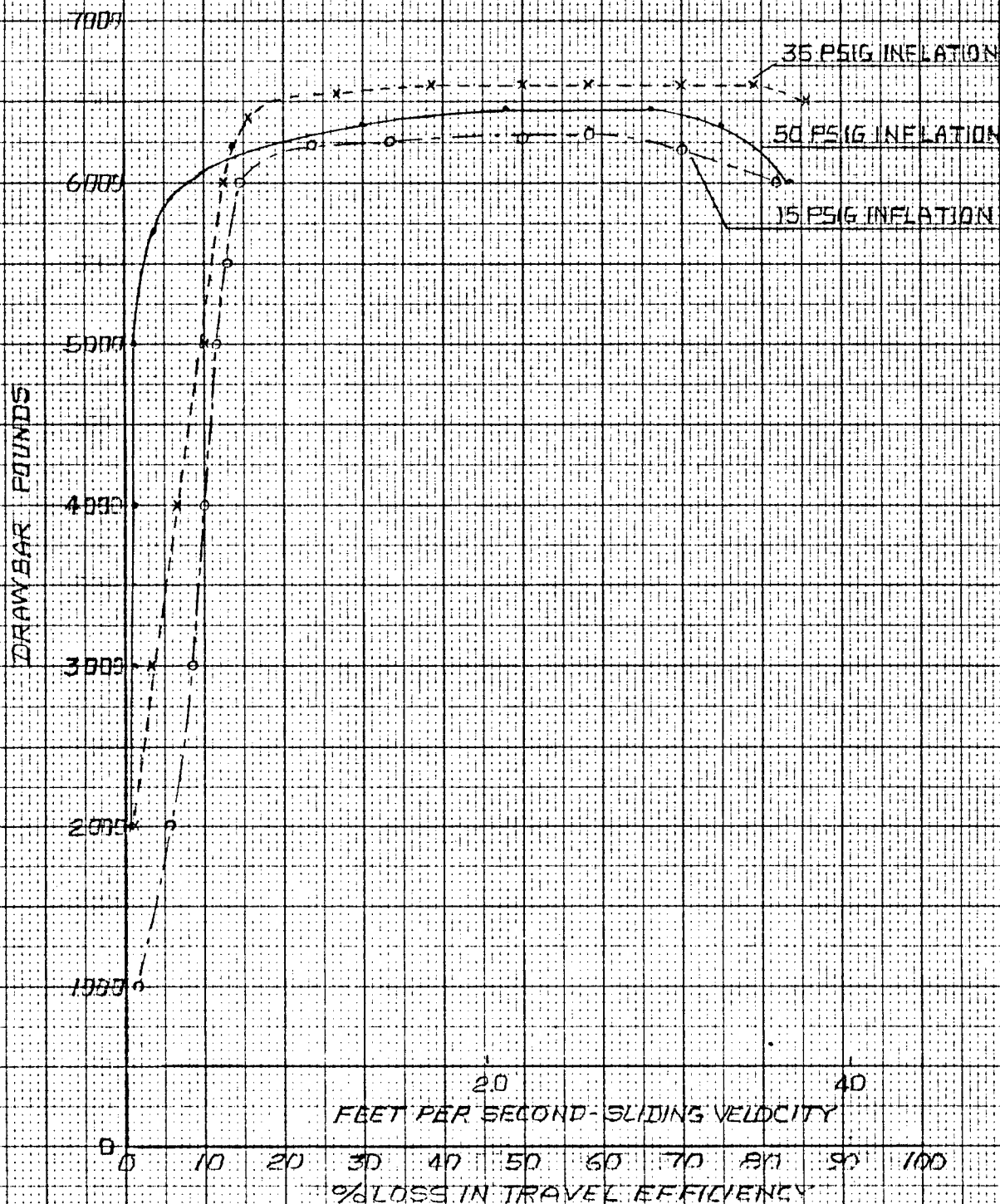
FIGURE NO. 75

Location: PROVING GROUND

Date: 11-10-73 Test By: WHS

Data By: D.G.

AIR TEMP RANGE 62°F
SURF TEMP RANGE 52°F



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
WET ASPHALT
GROUP: F RUN NO. 7

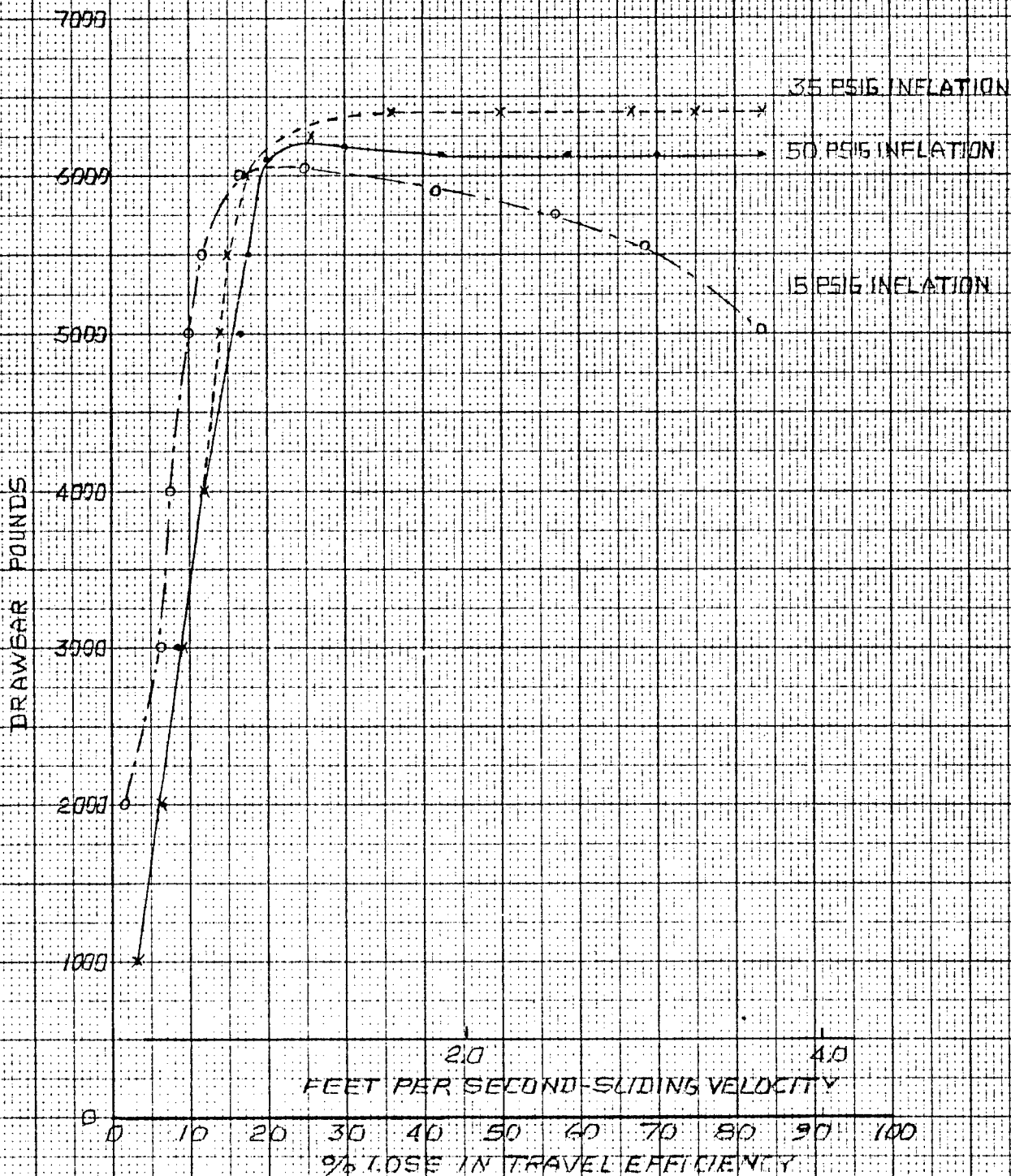
FIGURE NO. 76

Location: PROVING GROUND

Date: 11-10-73 Test By: WHS

Data By: JG

AMB TEMP RANGE 68°F
SURF TEMP RANGE 56°F



Nevada Automotive Test Center

Project: 20-17-30

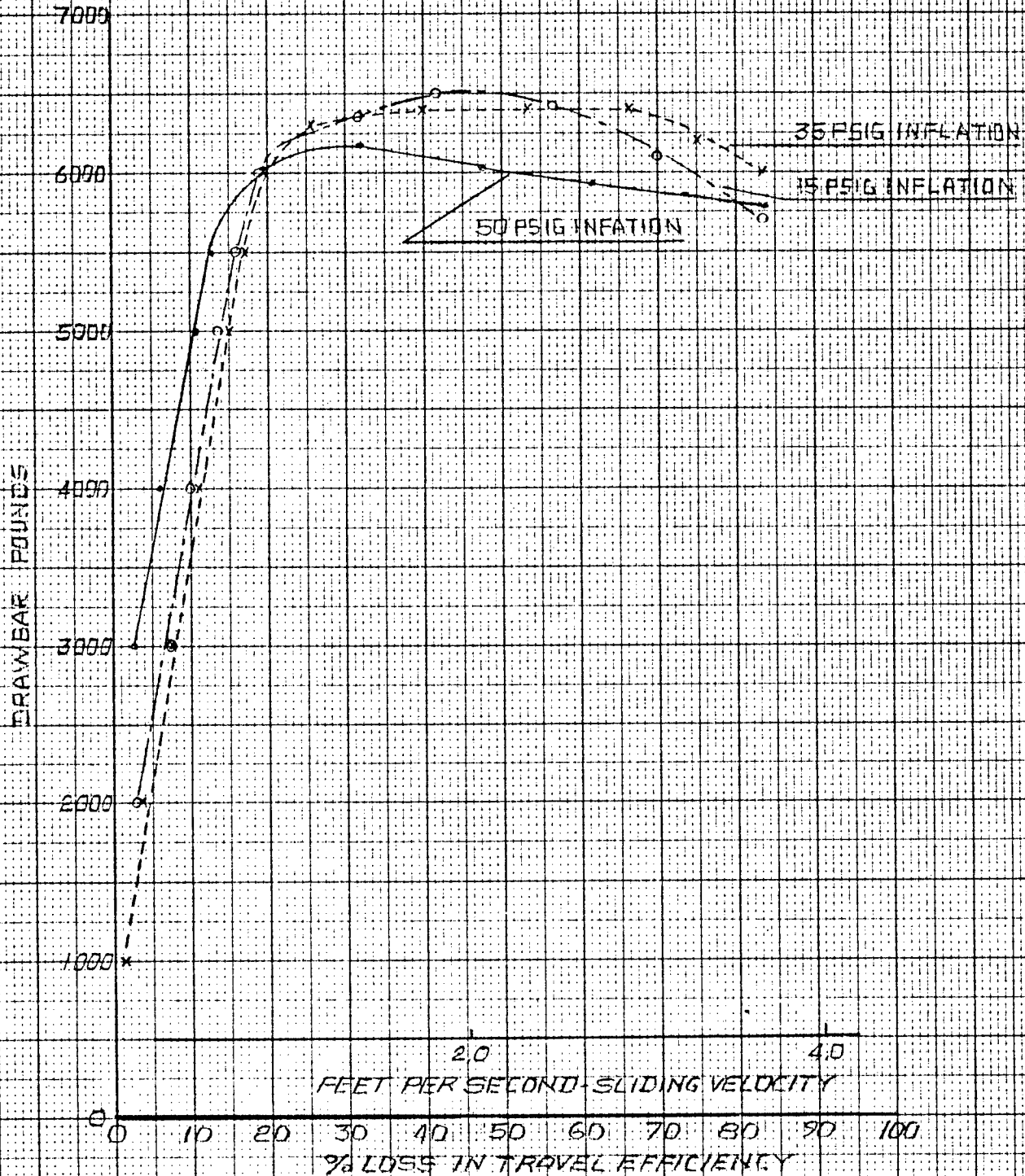
DYNAMIC TRACTION
WET ASPHALT
GROUP: B RUN NO. 8
FIGURE NO. 77

Location: PROVING GROUND

Date: 11-10-73 Test By: WHS

Data By: DG

AMB. TEMP RANGE 74°F
SURF. TEMP RANGE 58°F



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
WET ASPHALT

GROUP E RUN NO 9

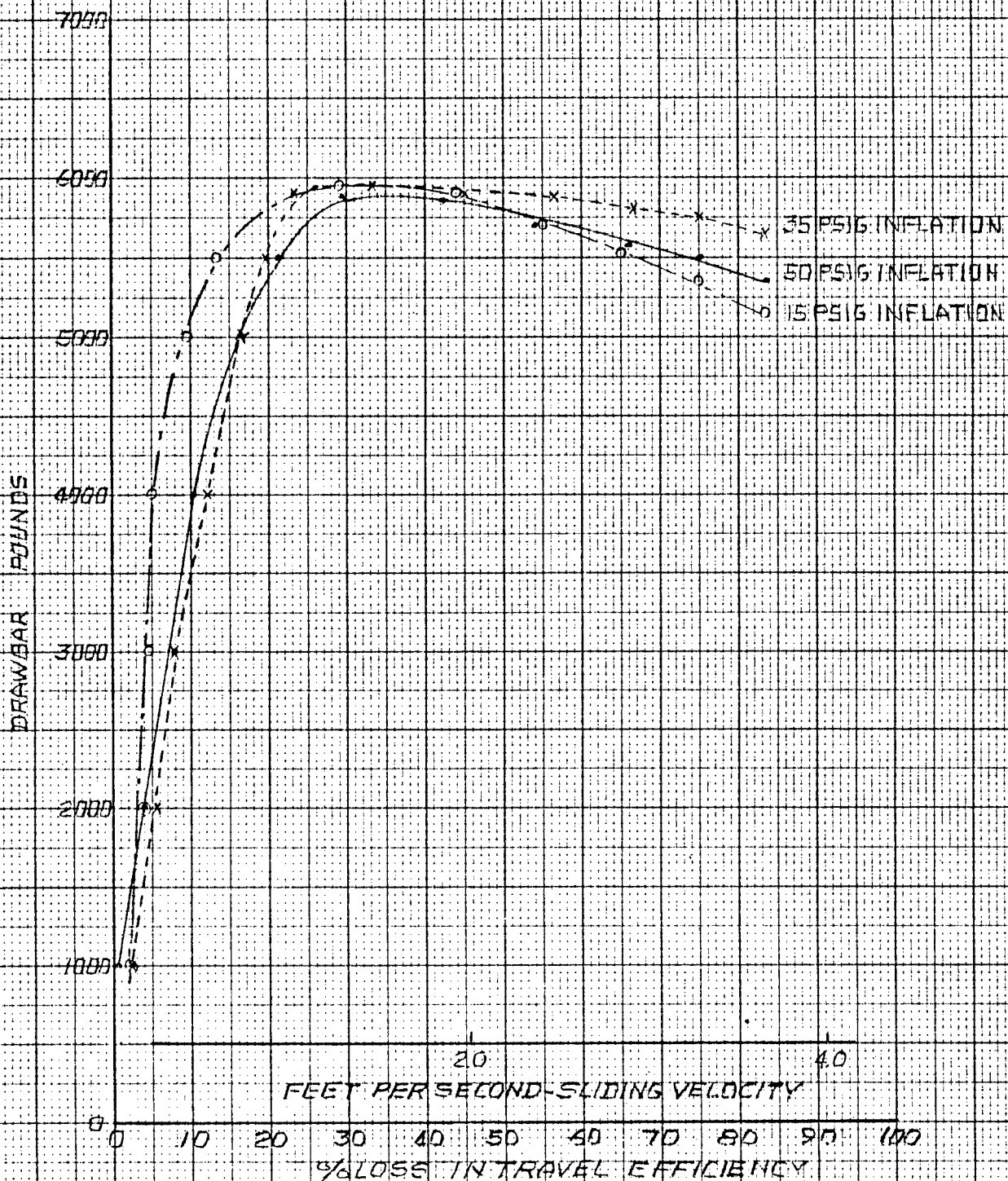
FIGURE NO. 78

Location: PROVING GROUND

Date: 11-10-73 Test By: WHS

Data By: DG

AMB. TEMP RANGE 72°F
SURF TEMP RANGE 59°F



Nevada Automotive Test Center

Project: 20-17-30

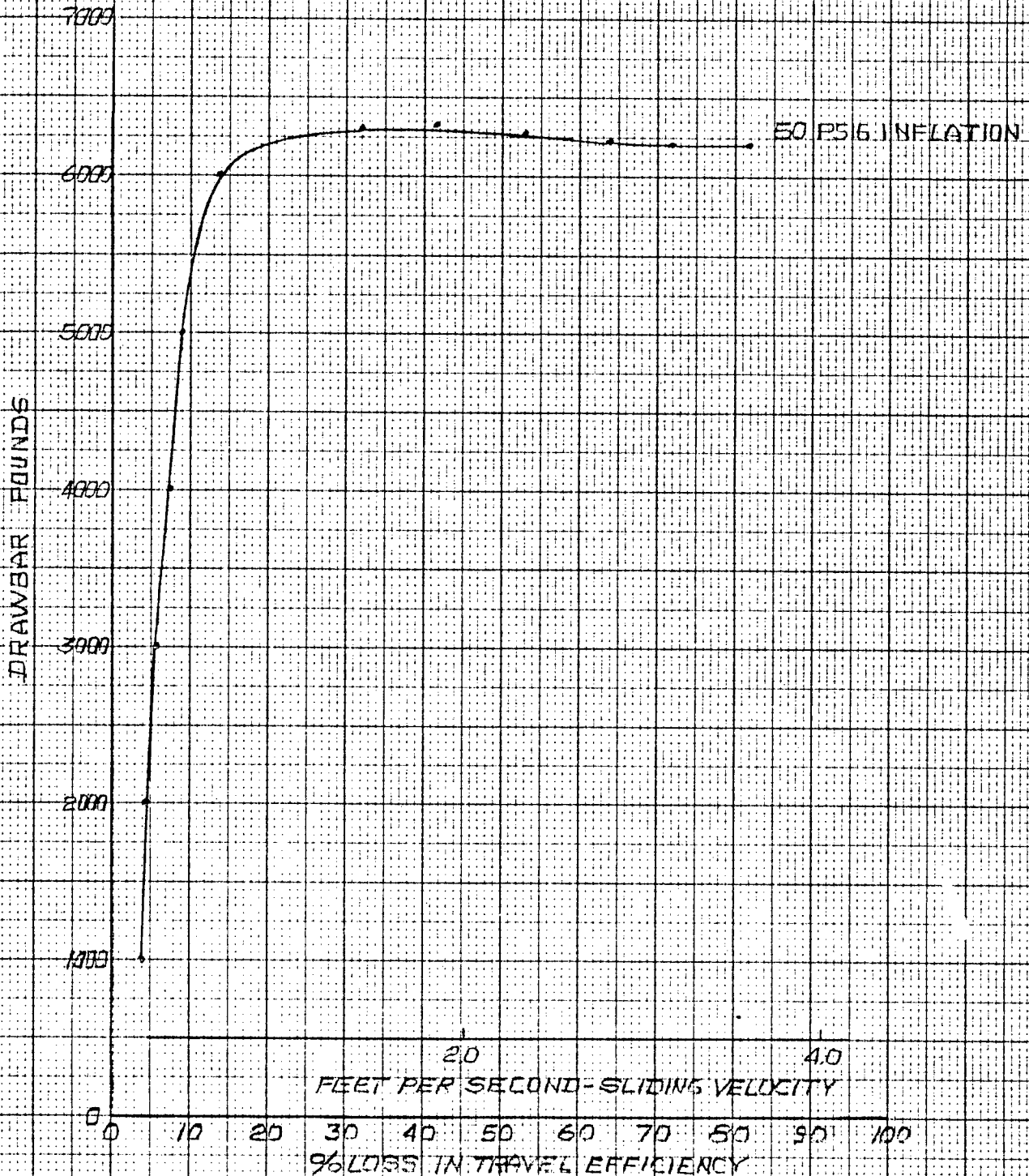
DYNAMIC TRACTION
WET ASPHALT
GROUP C RUN NO. 10
FIGURE NO. 79

Location: PROVING GROUND

Date: 11-10-73 Test By: WHS

Data By: DG

AMB. TEMP RANGE 68°F
SURF. TEMP RANGE 58°F



TEST DATA

Figure Nos. 80 and 81

Rolling Resistance - Dry Asphalt

Nevada Automotive Test Center

Project: 20-17-30

ROLLING RESISTANCE
DRY ASPHALT

5 MPH

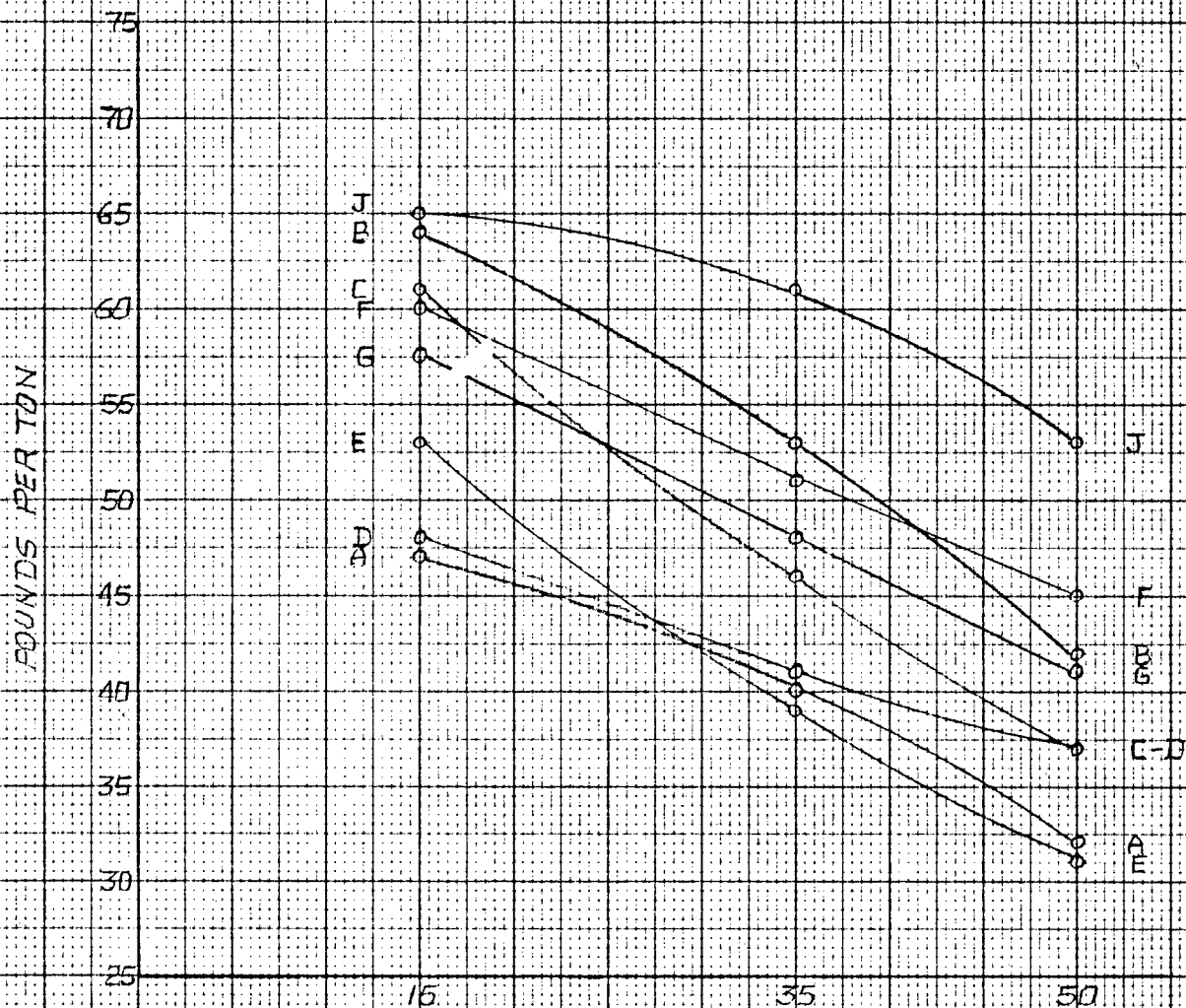
FIGURE NO. 80

Location: STOP & GO

Date: 2-27-74

Test By: JED

Data By: JED



INFLATION PRESSURE, PSIG

GROUP	15	%	35	%	50	%
A	47	123	40	113	32	114
B	64	95	53	85	42	86
C	61	100	46	100	37	100
D	48	121	41	111	37	100
E	53	113	39	115	31	116
F	60	102	51	89	45	78
G	55	110	48	98	41	89
J	65	93	61	67	53	57

Nevada Automotive Test Center

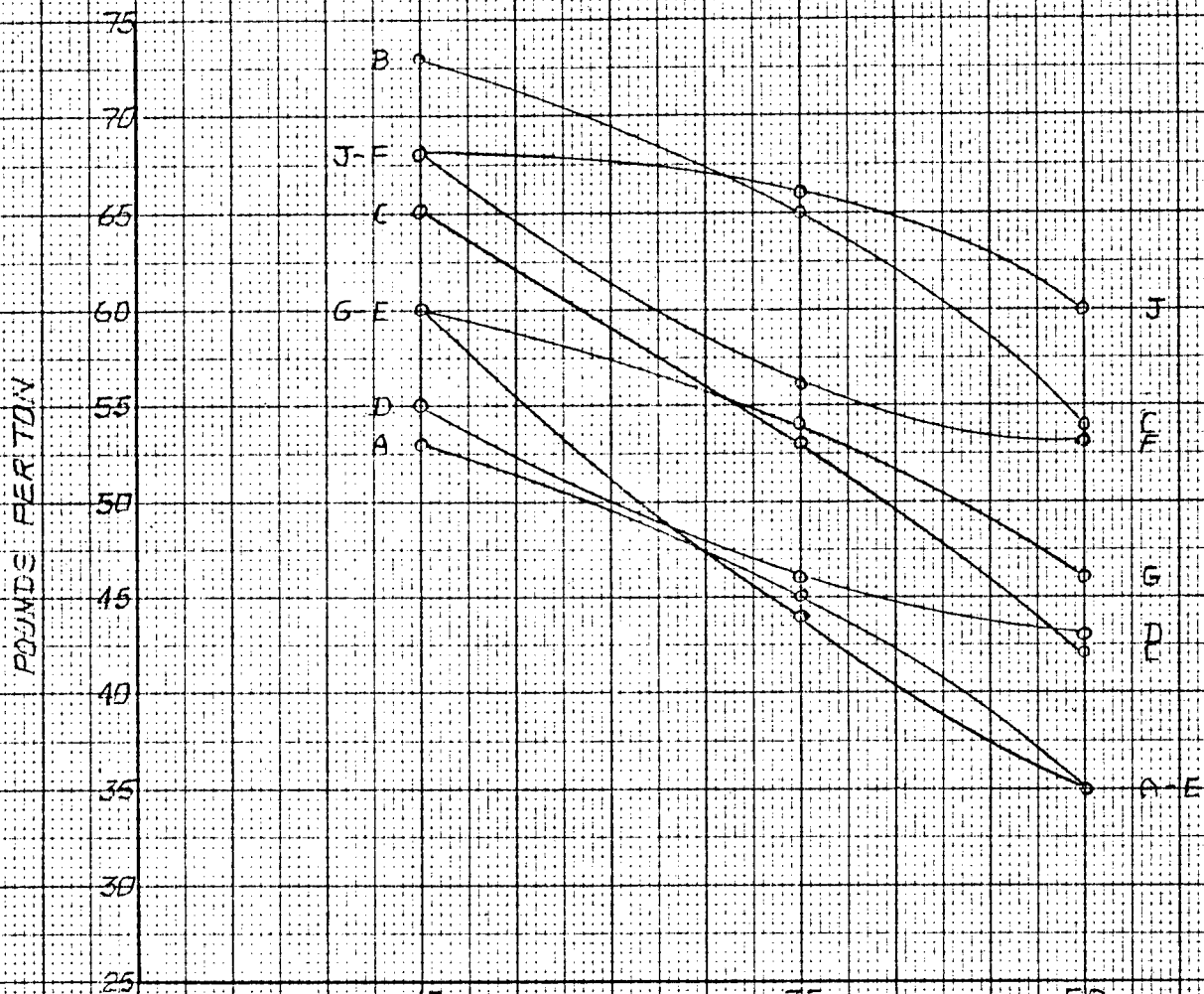
Project 20-17-30

ROLLING RESISTANCE
 DRY ASPHALT
 40 MPH
 FIGURE NO. 81

Location: STOP # 60

Date: 2-27-74 Test By: JED

Data By: JED



GROUP	INFLATION PRESSURE, PSIG					
	15		35		50	
	LBS/TON	%	LBS/TON	%	LBS/TON	%
A	53	118	45	115	35	83
B	73	88	65	77	54	71
C	65	100	53	100	42	100
D	55	115	46	113	43	98
E	60	103	44	117	35	117
F	68	95	56	94	53	74
G	60	103	54	98	46	90
J	68	95	66	75	60	57

TEST DATA

Figure No. 82

Dynamic Traction Summary - Packed Clay

Project 20-17-30

DYNAMIC TRACTION RATINGS

PACKED CLAY
4 WHEEL DRIVE

FIGURE NO. 82

Location: PROVING GROUND

Date: 10-29/30-73 Test By: WHS

Data By: JED

DRAWBAR ROUNDS

•	RATING %	50 PS/G
X	RATING %	35 PS/G
0	RATING %	15 PS/G
	AVE. DB	78.3 @ 50 PS/G
	AVE. DB	72.5 @ 35 PS/G
	AVE. DB	68.5 @ 15 PS/G

CODE

75NBY 401361W03

AMB. TEMA.

082-013 +032-904 +082-002 +022-902 +022-905 +022-212

54°F	54°F	58°F	59°F	59°F	40°F
------	------	------	------	------	------

$$180^\circ 22' + 26^\circ 22' +$$

29°F	52°F
------	------

1022712

64.5

TEST DATA

Figure Nos. 83 through 91

Dynamic Traction - Packed Clay

Nevada Automotive Test Center

Project: 20-17-30

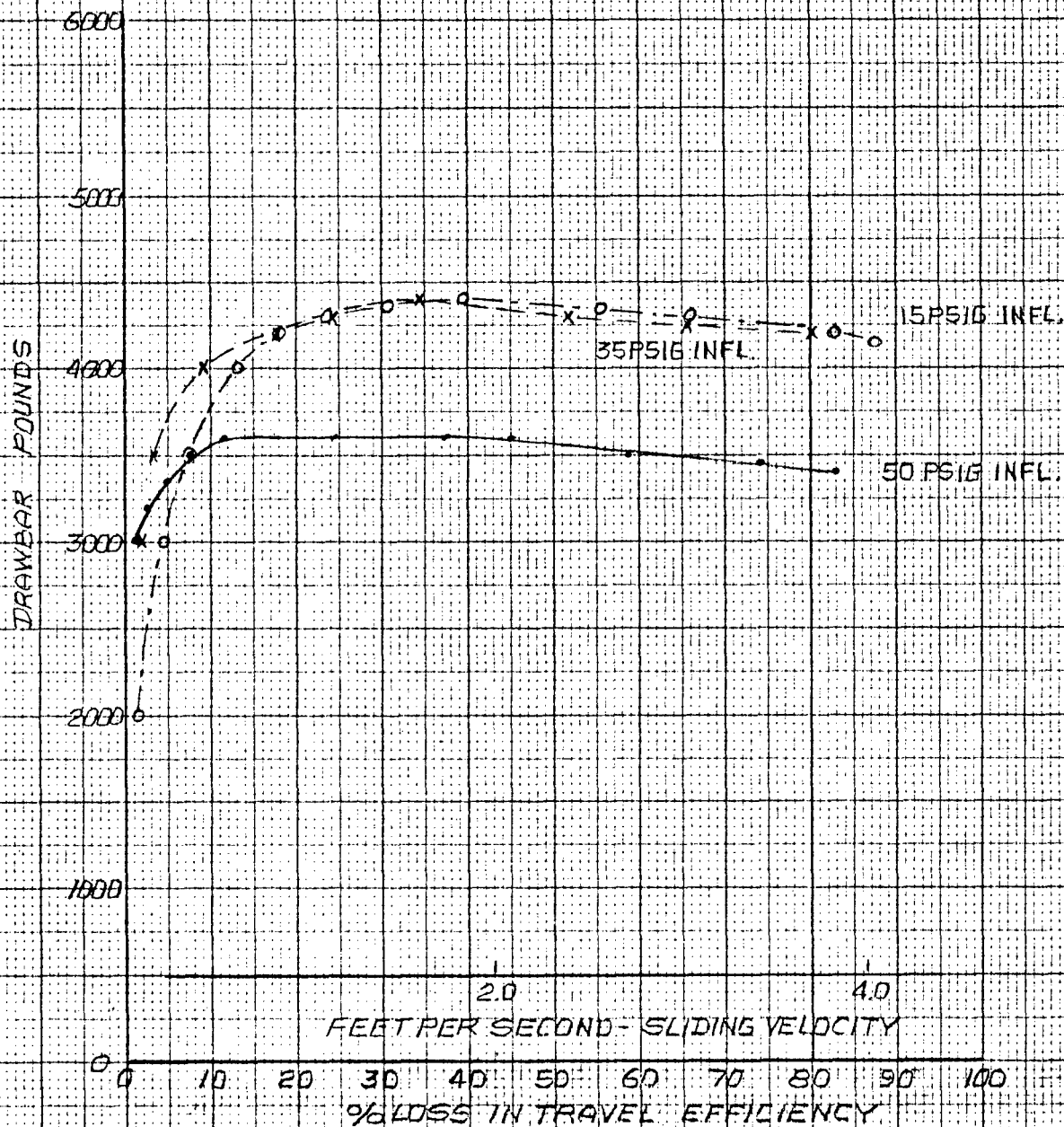
DYNAMIC TRACTION
PACKED CLAY
GROUP C RUN NO. 1
FIGURE NO. 83

Location: PROVING GROUND

Date: 10-29-73 Test By: WHS

Data By: JED

AMB. TEMP. 40°F
SURF. TEMP. 40°F
COMPACTION RANGE: 212/220+
4 WHEEL DRIVE



Nevada Automotive Test Center

Project 20-17-30

DYNAMIC TRACTION

PACKED CLAY

GROUP F RUN NO.2

FIGURE NO. 84

Location: PROVING GROUND

Date 10-29-73 Test By: WHS

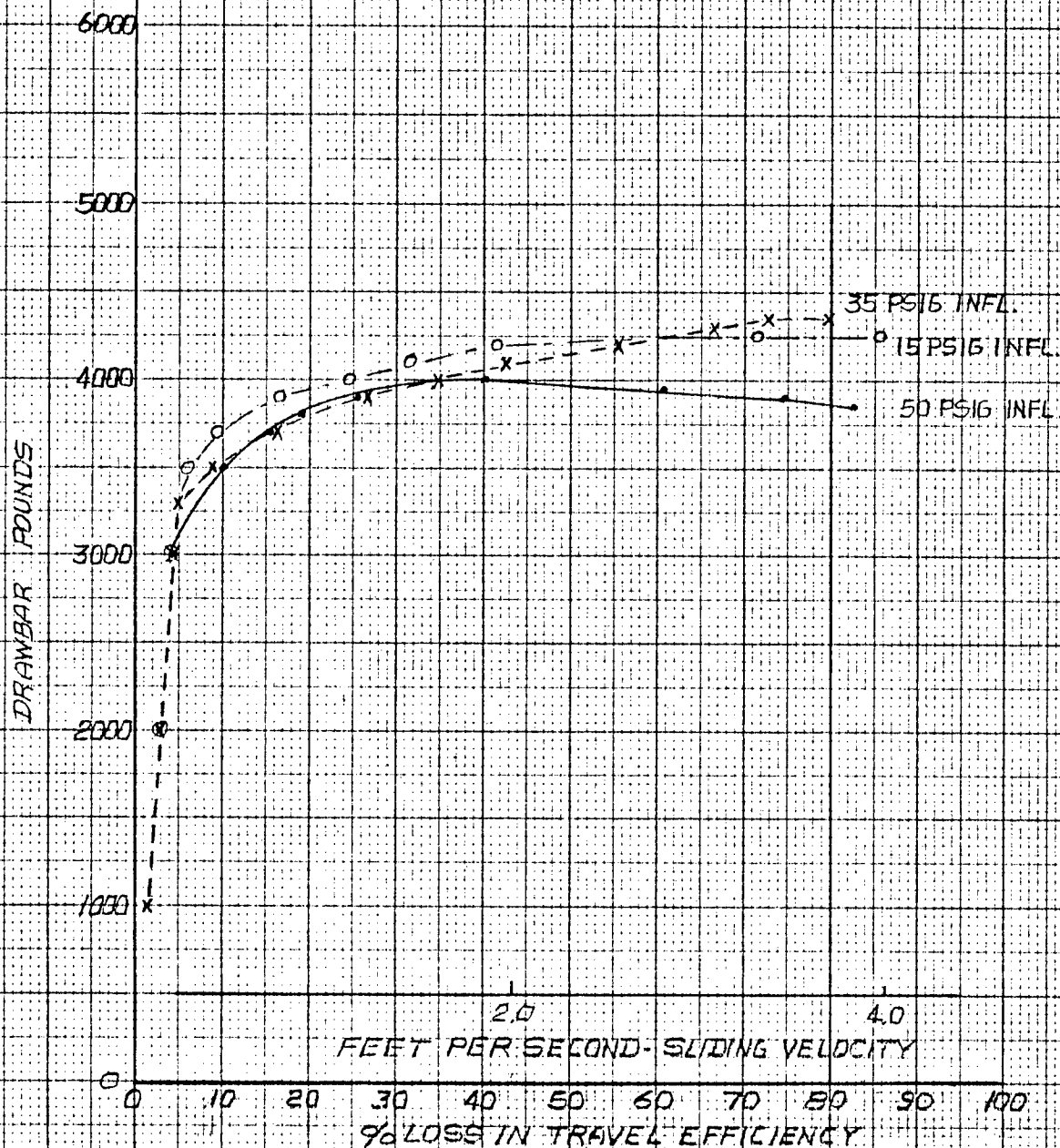
Data By: JED

AMB. TEMP. 54°F

SURF. TEMP. 55°F

COMPACTION RANGE: 210/220+

4 WHEEL DRIVE



Nevada Automotive Test Center

Project 20-17-30

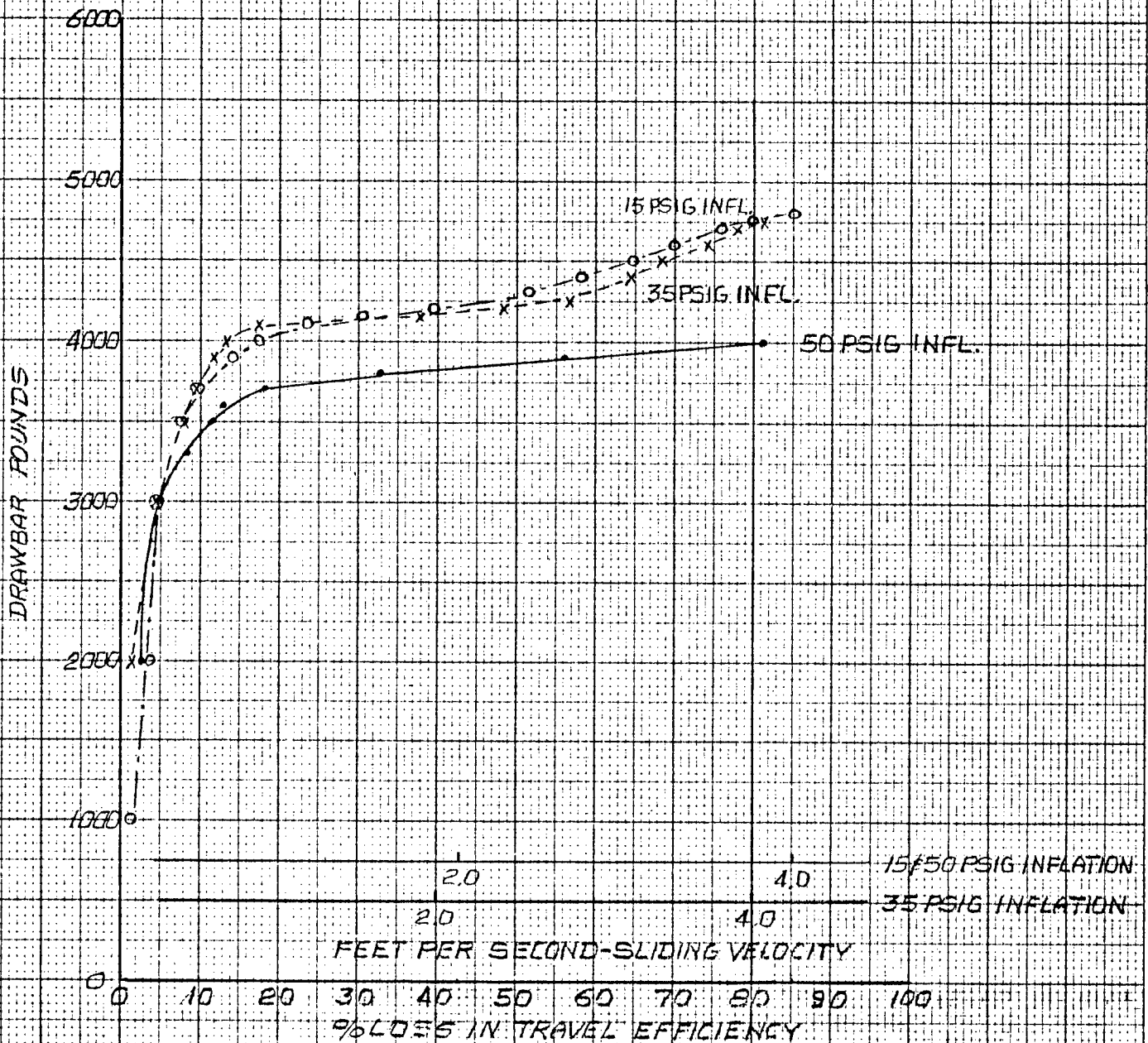
DYNAMIC TRACTION
PACKED CLAY
GROUP B RUN NO. 3
FIGURE NO. 85

Location: PROVING GROUND

Date 10-29-73 Test By: WHS

Data By: JED

AMB. TEMP. 59°F
SURF. TEMP. 62°F
COMPACTION RANGE: 208/220+
4 WHEEL DRIVE



Nevada Automotive Test Center

Project 20-17-30

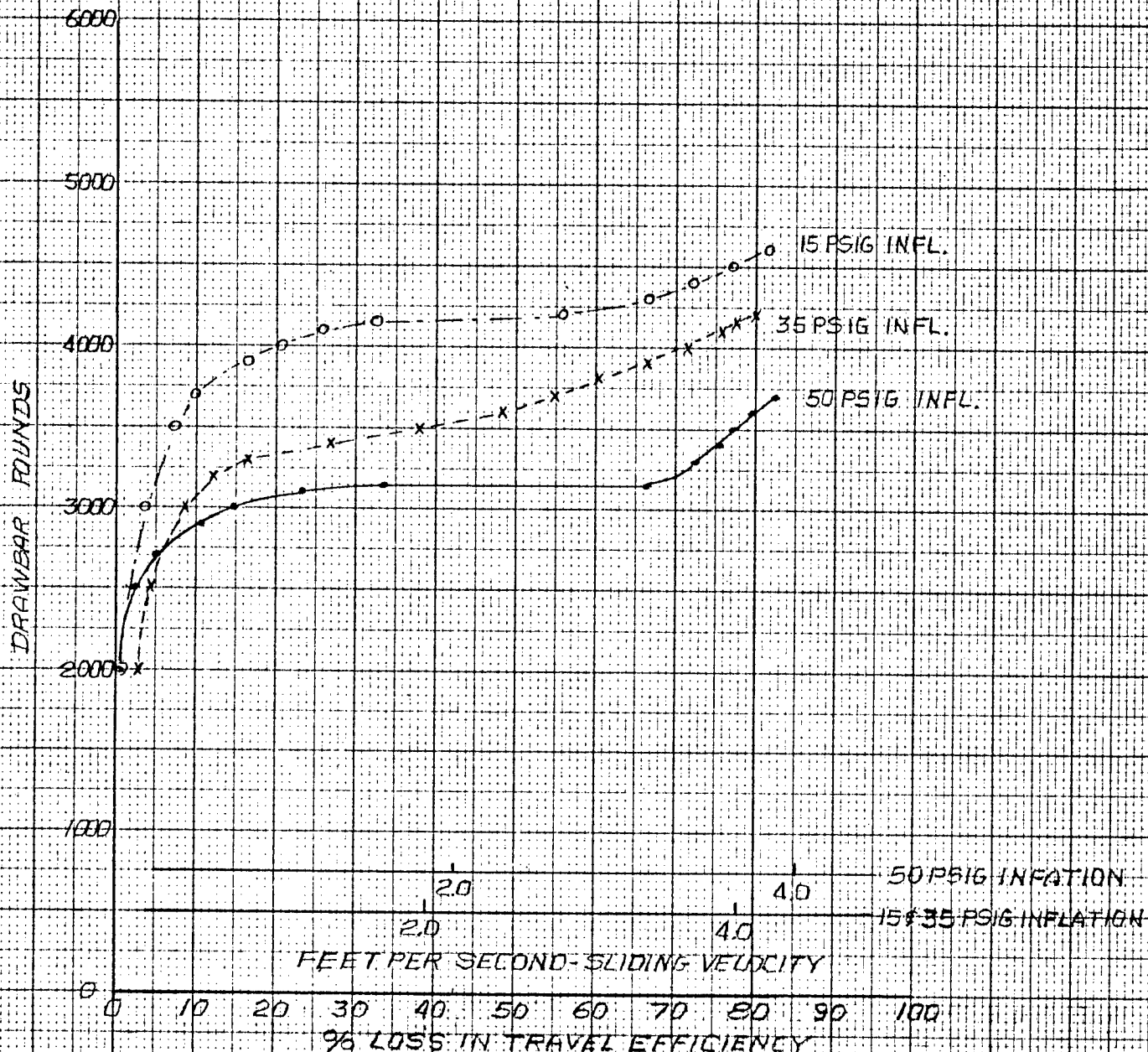
DYNAMIC TRACTION
PACKED CLAY
GROUP A RUN NO. 4
FIGURE NO. 86

Location: PROVING GROUND

Date: 10-29-73 Test By: WHS

Data By: JED

AMB. TEMP. 59°F
SURF TEMP. 62°F
COMPACTION RANGE: 206/220+
4-WHEEL DRIVE



Nevada Automotive Test Center

Project: 20-17-30

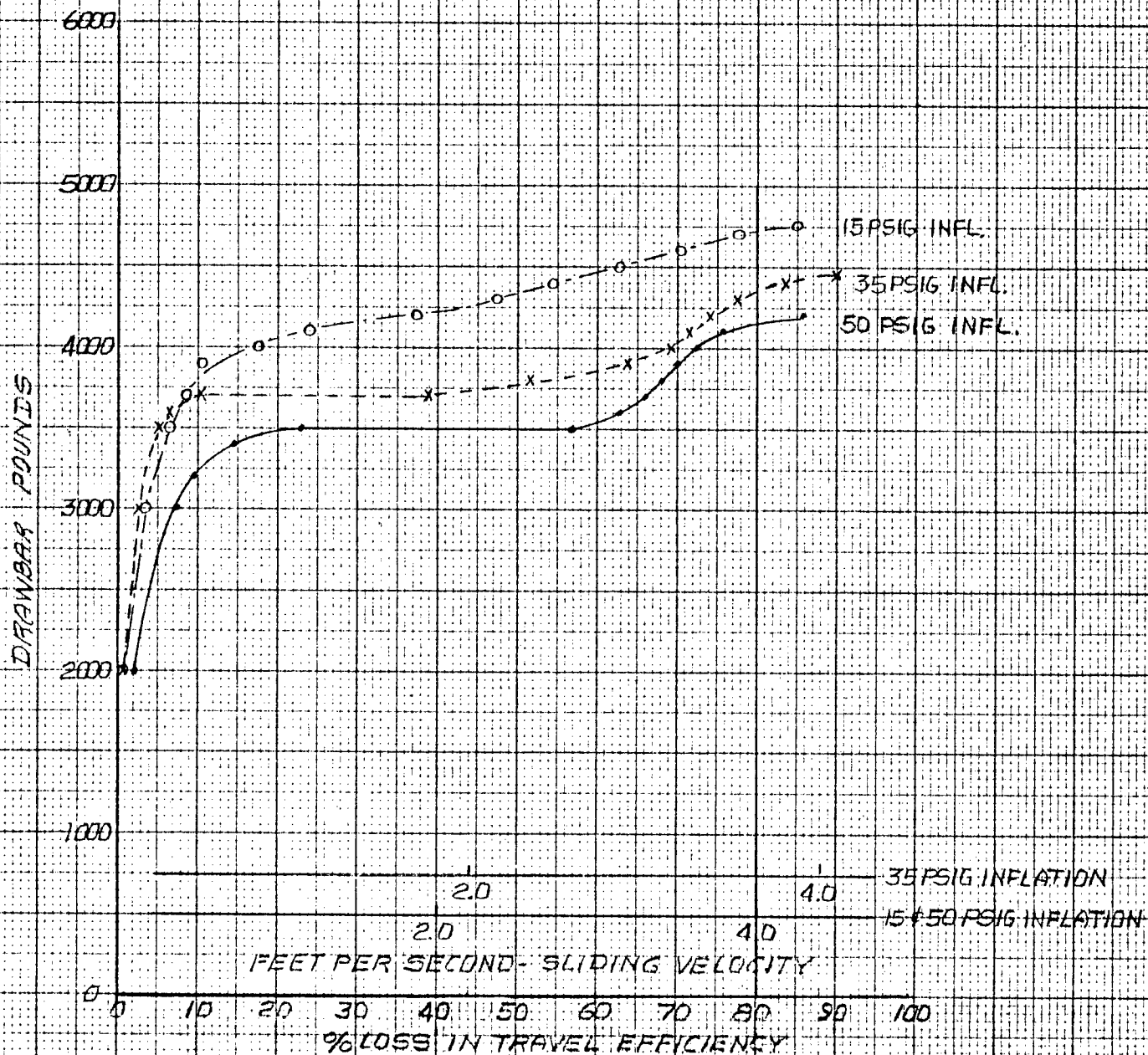
DYNAMIC TRACTION
PACKED CLAY
GROUP J RUN NO. 5
FIGURE NO. 87

Location: PROVING GROUND

Date: 10-29-73 Test By: WHS

Data By: JED

AMB. TEMP. 52°F
SURF TEMP. 60°F
COMPACTION RANGE 216/220+
4-WHEEL DRIVE



Nevada Automotive Test Center

Project 20-17-30

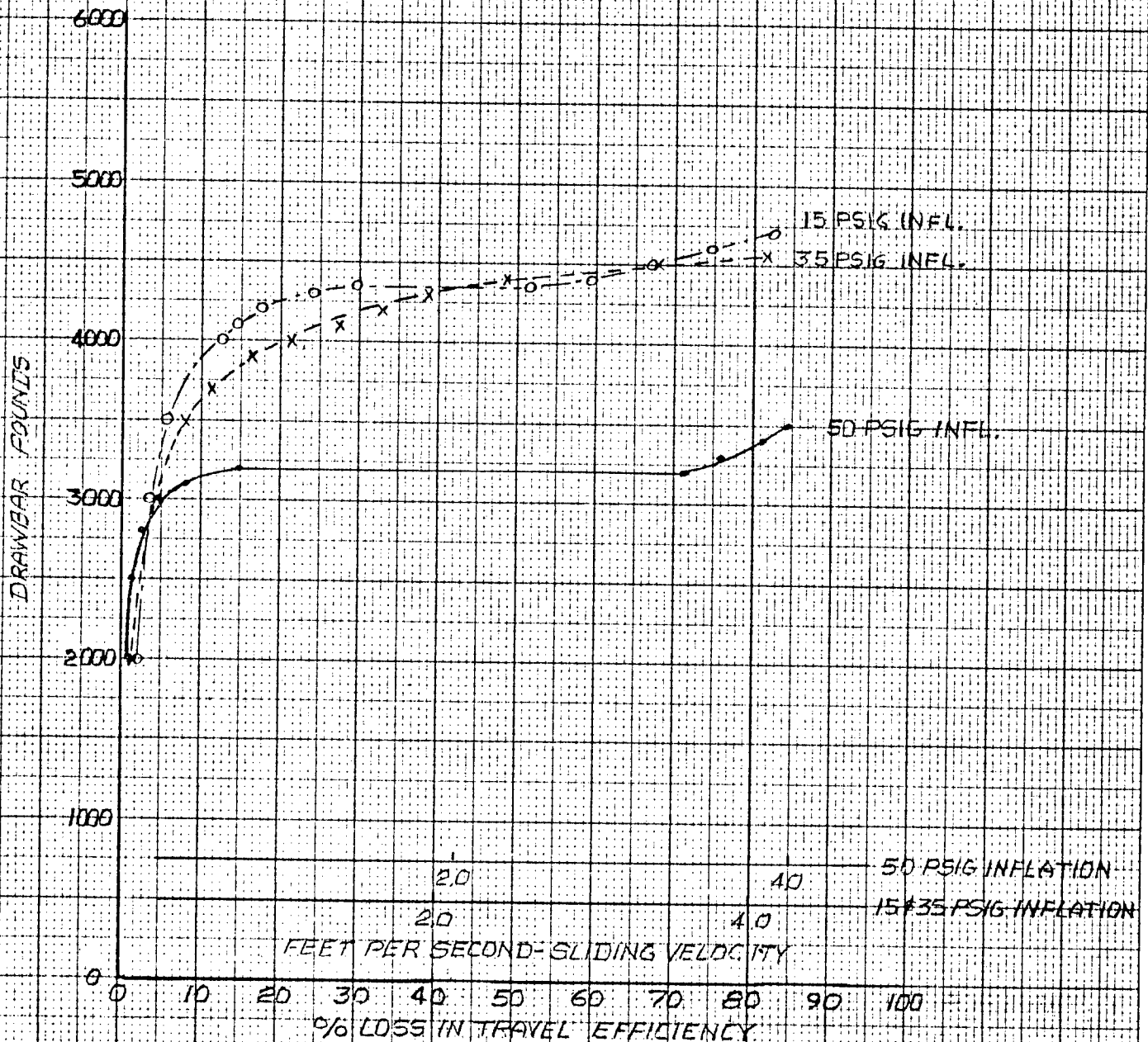
DYNAMIC TRACTION
PACKED CLAY
GROUP E RUN NO. 6
FIGURE NO. 88

Location: PROVING GROUND

Date: 10-29-73 Test By: WHS

Data By: JED

AMB. TEMP. 54°F
SURF TEMP. 60°F
COMPACTION RANGE: 208/220+
4 WHEEL DRIVE



Nevada Automotive Test Center

Project: 20-17-30

DYNAMIC TRACTION
PACKED CLAY
GROUP G RUN NO. 7
FIGURE NO. 89

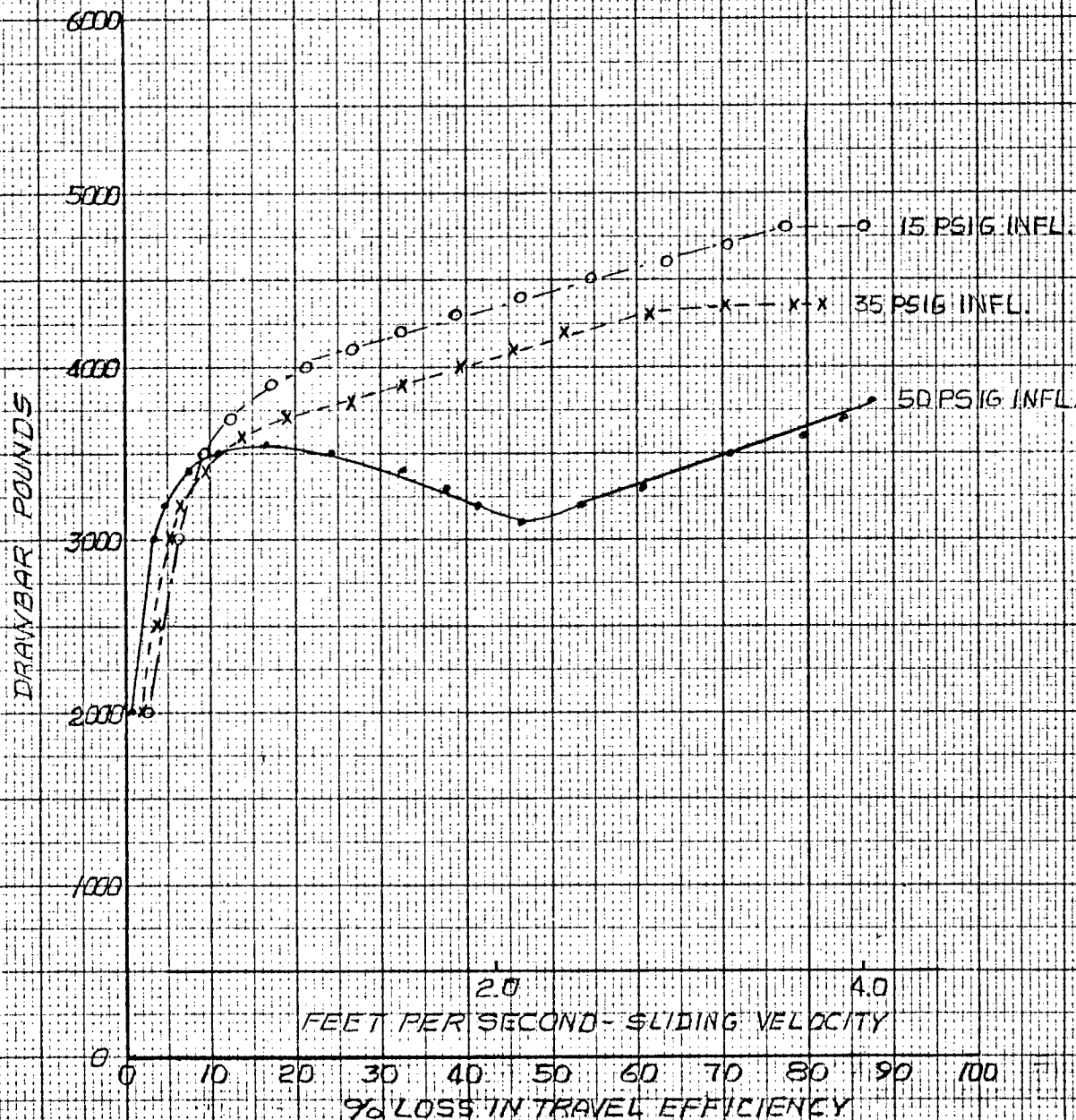
Location: PROVING GROUND

Date: 10-30-73

Test By: WHS

Data By: JED

AMB. TEMP. 29°F
SURF. TEMP. 36°F
COMPACTION RANGE: 180/220+
4 WHEEL DRIVE



Nevada Automotive Test Center

Project: 20-17-30

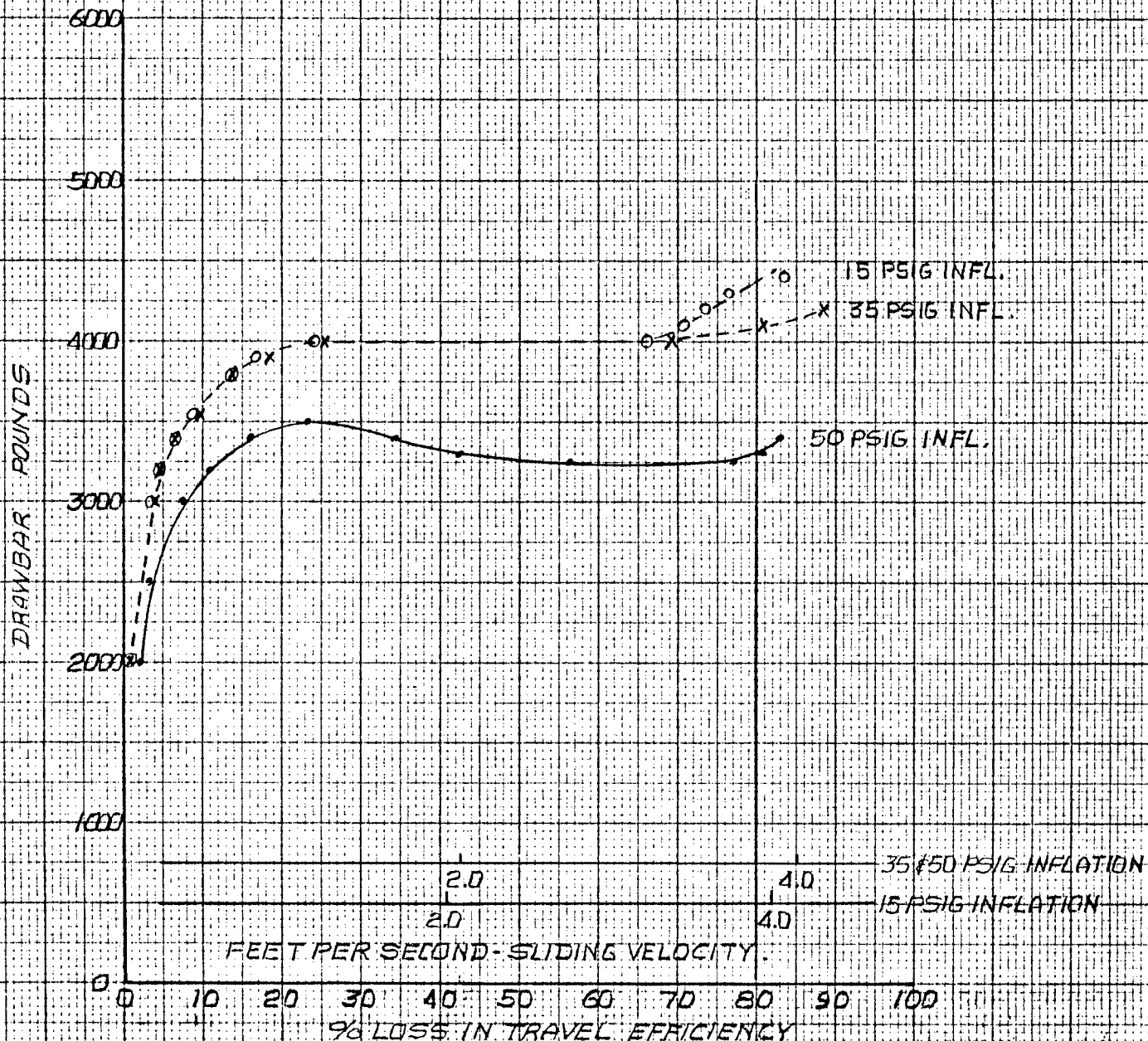
DYNAMIC TRACTION
PACKED CLAY
GROUP D RUN NO. 8
FIGURE NO. 90

Location: PROVING GROUND

Date: 10-30-73 Test By: WHS

Data By: JED

AMB. TEMP. 58°F
SURF TEMP. 46°F
COMPACTION RANGE: 200-220+
4 WHEEL DRIVE



Nevada Automotive Test Center

Project: 20-17-30

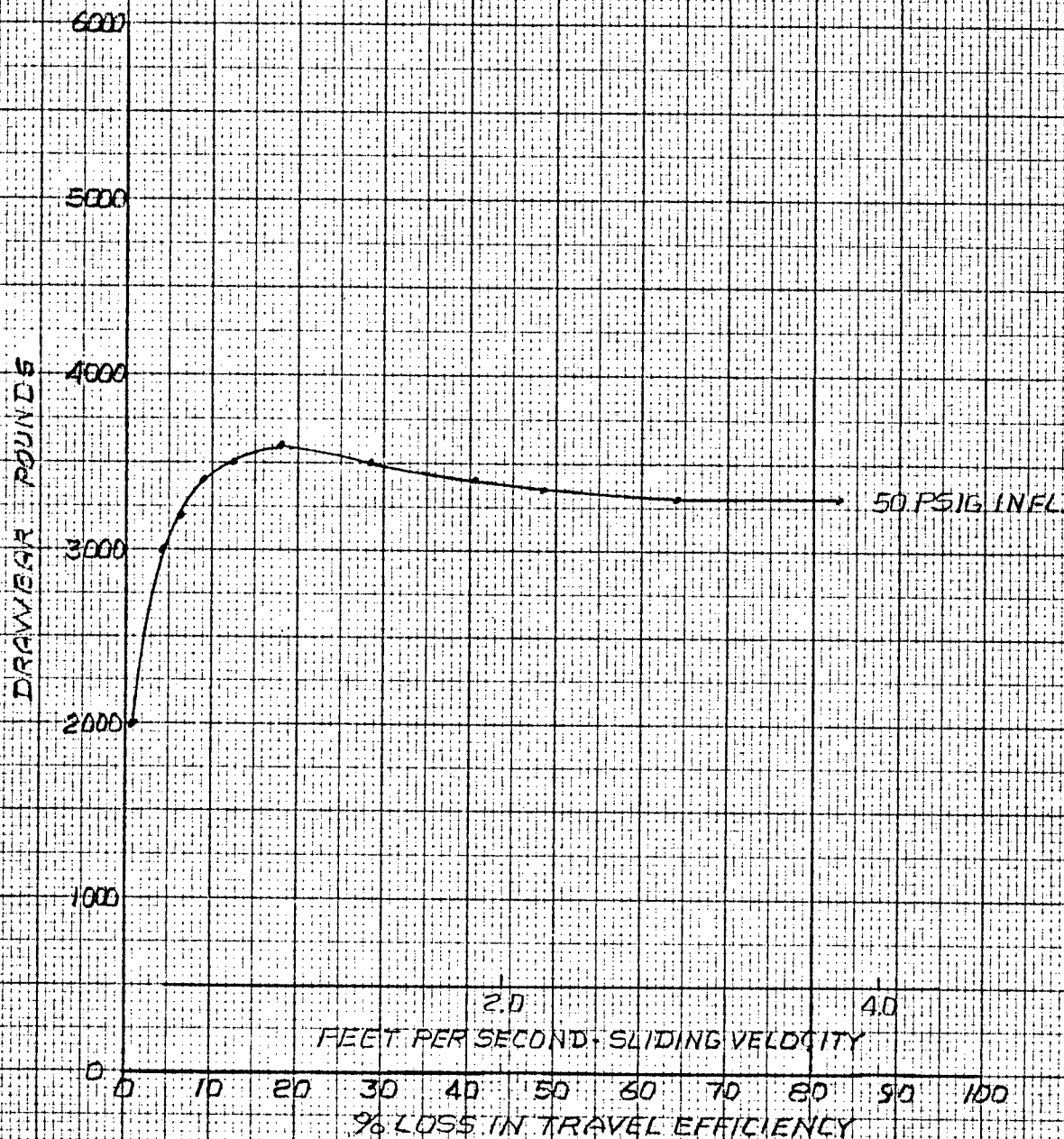
DYNAMIC TRACTION
PACKED CLAY
GROUP C RUN NO. 9
FIGURE NO. 91

Location: PROVING GROUND

Date: 10-30-73 Test By: WHS

Data By: JED

AMB. TEMP. 64°F
SURE TEMP. 65°F
COMPACTION RANGE: 214/220+
4 WHEEL DRIVE



TEST DATA

Figure No. 92

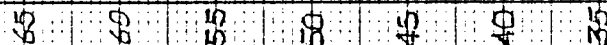
Rolling Resistance - Packed Clay

Nevada Automotive Test Center
Project: 20-17-30

ROLLING RESISTANCE
PACKED CLAY
FIGURE NO. 92

Location: PROVING GROUND
Date: 10-29/30-73 Test By: WHH

Data By: JED
GROSS WT. 5.177 TONS
11.534+85



POUNDS PER TON

RATING @ 50 PSI/G
RATING @ 35 PSI/G
RATING @ 15 PSI/G

AVE. 185 / TON @ 50	PSIS	•
AVE. 155 / TON @ 35	PSIS	X
AVE. 135 / TON @ 15	PSIS	0

7003

CONFACION RANGE

AMIB. TEMP.

SURF. TEMP.

CONFIDENTIAL

TEST DATA

Figure No. 93

Ton Mile Per Hour Breaker Temperatures

Nevada Automotive Test Center

Project: 20-17-30

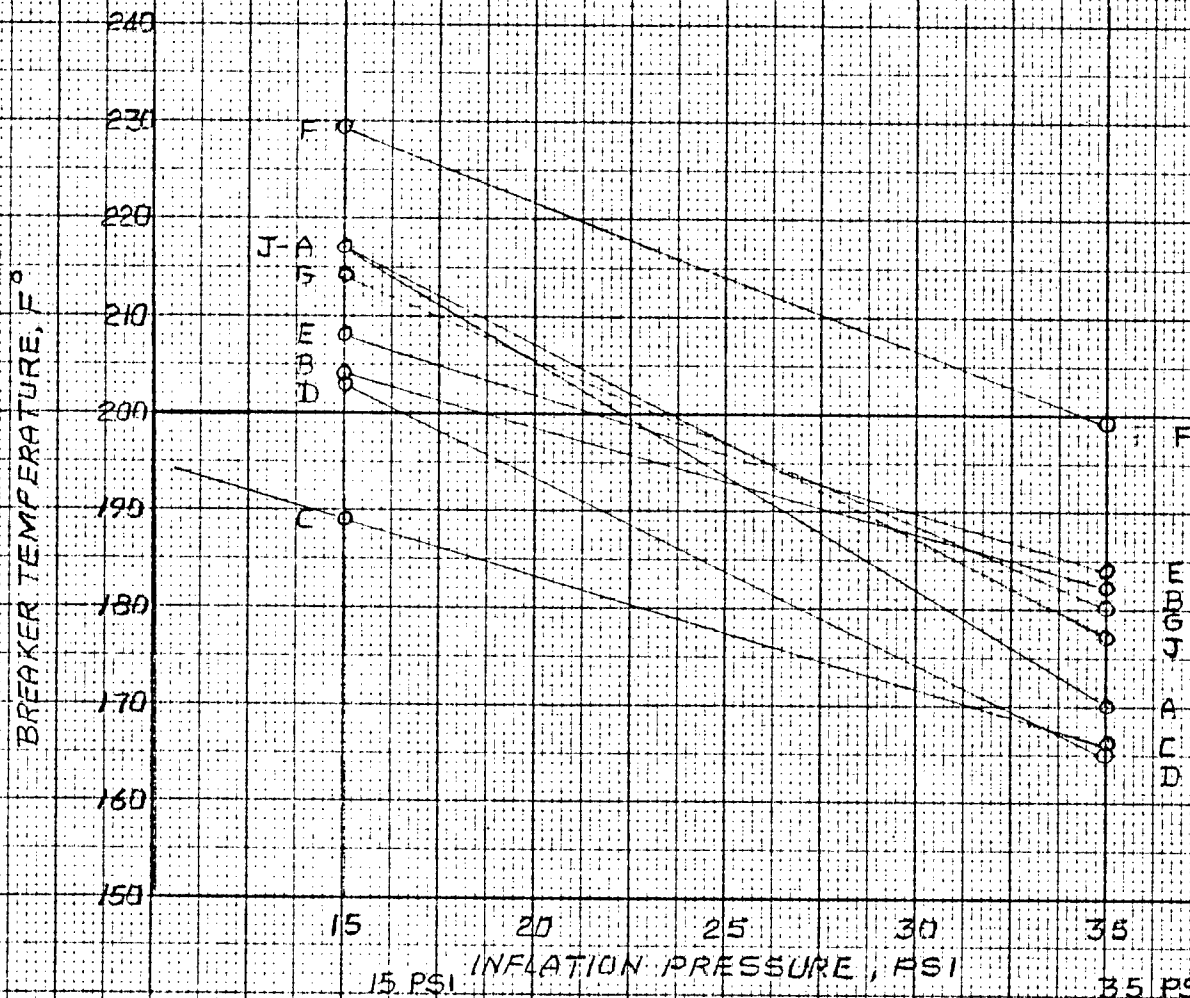
TON MILE PER HOUR
BREAKER TEMPERATURE

Location: ROUTE 50

Date: 2-12/21-74 Test By: JED

35 MPH
FIGURE NO. 93

Data By: JED



GROUP	TEMP °F	TMPH	TEMP °F	TMPH
A	217	57.07	170	57.24
B	204	56.68	182	56.52
C	189	57.02	166	57.31
D	203	57.14	165	57.44
E	208	57.19	184	56.98
F	229.5	56.46	199	56.03
G	214	56.01	180	56.87
J	217	56.15	177	56.76

TEST DATA

Figure Nos. 94 and 95

Braking Summaries

Location: PROVING GROUND

Date: 11-16-73.

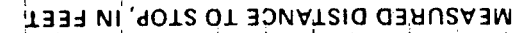
Test By: D G

4. WHFEL

100

SURFACE SE#5

FIGURE NO. 94



RATING

AVG. FT.

CODE

AMB. OF.

59

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57.5

Wet Asphalt

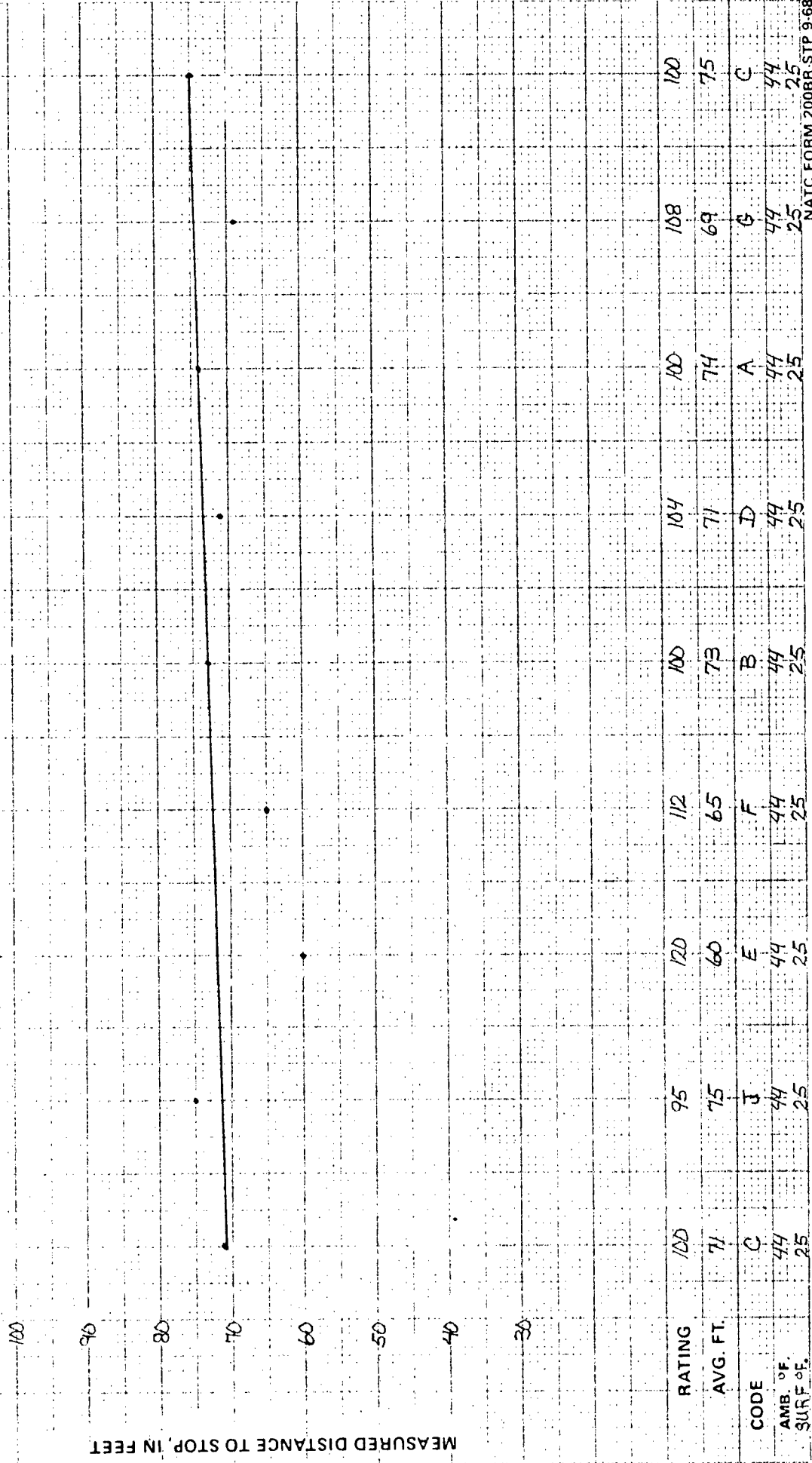
30-0 mph 4-Wheel Braking

NATC Code	Meas. Dist. To	Calc. Dist. To	Meas. Time To	Avg. DCLR 30-0 MPH	30.0-22.5 MPH			22.5-15.0 MPH			15.0-7.5 MPH			7.5-0 MPH		
					Time	Dist.	DCLR	Time	Dist.	DCLR	Time	Dist.	DCLR	Time	Dist.	DCLR
	Stop, Feet	Stop, Feet	Stop, Sec.	MPH	Sec.	Feet	Ft/Sec. ²	Sec.	Feet	Ft/Sec. ²	Sec.	Feet	Ft/Sec. ²	Sec.	Feet	Ft/Sec. ²
C	79	83	3.65	12.3	0.85	33	12.9	1.05	29	10.5	1.00	17	11.0	0.75	4	14.7
G	84	85	3.65	12.3	0.95	37	11.6	1.00	28	11.0	0.98	16	11.2	0.72	4	15.3
A	87	90	3.95	11.2	1.00	39	11.0	1.10	30	10.0	0.95	16	11.6	0.90	5	12.2
F	85	88	3.80	11.4	1.00	39	11.0	1.00	28	11.0	0.95	16	11.6	0.85	5	12.9
D	89	92	4.05	10.9	1.05	40	10.5	1.10	30	10.0	1.00	17	11.0	0.90	5	12.2
B	89	90	4.55	11.3	1.65	40	10.5	1.05	29	10.5	1.05	17	10.5	0.80	4	13.8
E	90	92	4.10	10.8	1.05	40	10.5	1.10	30	10.0	1.05	17	10.5	0.90	5	12.2
J	84	87	3.80	11.7	1.00	39	11.0	1.05	29	10.5	0.85	14	12.9	0.90	5	12.2
C	85	88	3.80	11.8	0.90	35	12.2	1.15	32	9.6	1.00	17	11.0	0.75	4	14.7

DCLR - Deceleration

Nevada Automotive Test Center
 Project: 20-17-30
 Location: SQUAW VALLEY, CALIF.
 Date: 11-7-73
 Test By: WS
 Data By: LW

FEET
 BRAKING
 Measured Distance To Stop
 DRY ICE
 4 WHEEL
 9 MPH
 FIGURE NO. 95



Dry Ice

9-0 mph Braking

NATC Code	Meas. Dist. To Stop, Feet	Calc. Dist. To Stop, Feet	Meas. Time To Stop, Sec.	Avg. 9-0 MPH	9.0-6.75 MPH			6.75-4.50 MPH			4.50-2.25 MPH			2.25-0 MPH		
					Time Sec.	Dist. Feet	DCLR Ft/Sec. ²	Time Sec.	Dist. Feet	DCLR Ft/Sec. ²	Time Sec.	Dist. Feet	DCLR Ft/Sec. ²	Time Sec.	Dist. Feet	DCLR Ft/Sec. ²
C	71	73	9.70	5.52	3.35	39	11.80	2.45	20	6.06	2.20	11	3.33	1.70	3	0.91
J	75	76	10.00	5.76	3.20	37	11.20	3.10	26	7.88	2.20	11	3.33	1.50	2	0.61
E	60	60	8.80	4.55	2.40	28	8.48	2.30	19	5.76	2.10	10	3.03	2.00	3	0.91
F	65	66	9.60	5.00	2.60	30	9.09	2.50	21	6.36	2.50	12	3.64	2.00	3	0.91
B	73	75	10.40	5.68	3.00	35	10.60	3.00	25	7.58	2.50	12	3.64	1.90	3	0.91
D	71	73	10.20	5.53	3.00	35	10.60	2.80	23	6.97	2.20	11	3.33	2.20	4	1.21
A	74	74	10.20	5.61	3.00	35	10.60	2.90	24	7.27	2.40	12	3.64	1.90	3	0.91
G	69	70	9.90	5.30	2.70	31	9.39	2.90	24	7.27	2.40	12	3.64	1.90	3	0.91
C	75	76	10.50	5.76	3.00	35	10.60	3.20	26	7.88	2.50	12	3.64	1.80	3	0.91

DCLR - Deceleration

TEST DATA

Figure Nos. 96 through 105

Spring Rates

Nevada Automotive Test Center

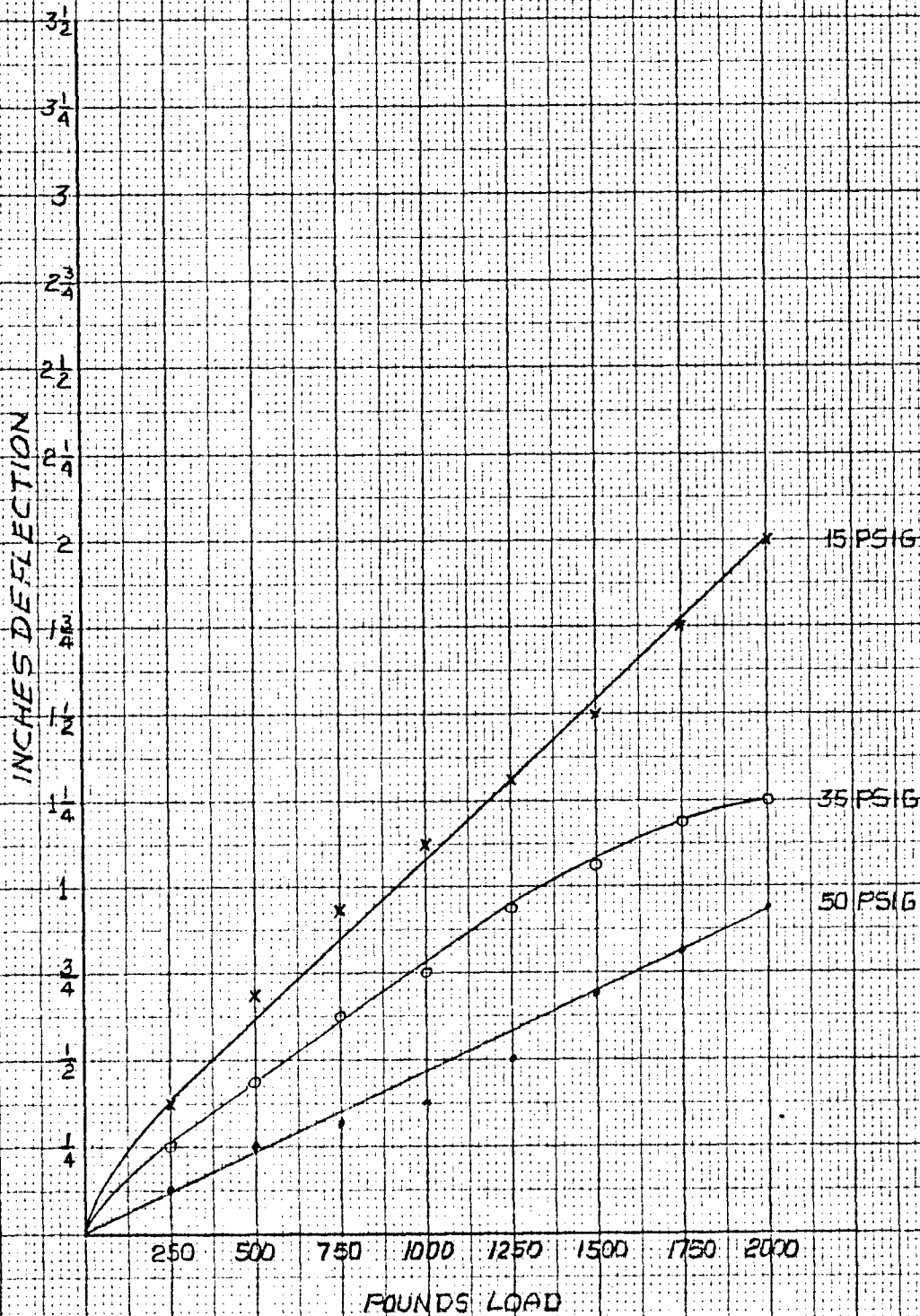
Project: 20-17-30

SPRING RATES
STANDARD MILITARY
NDCC BIAS PLY
FIGURE NO. 96

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED



Nevada Automotive Test Center

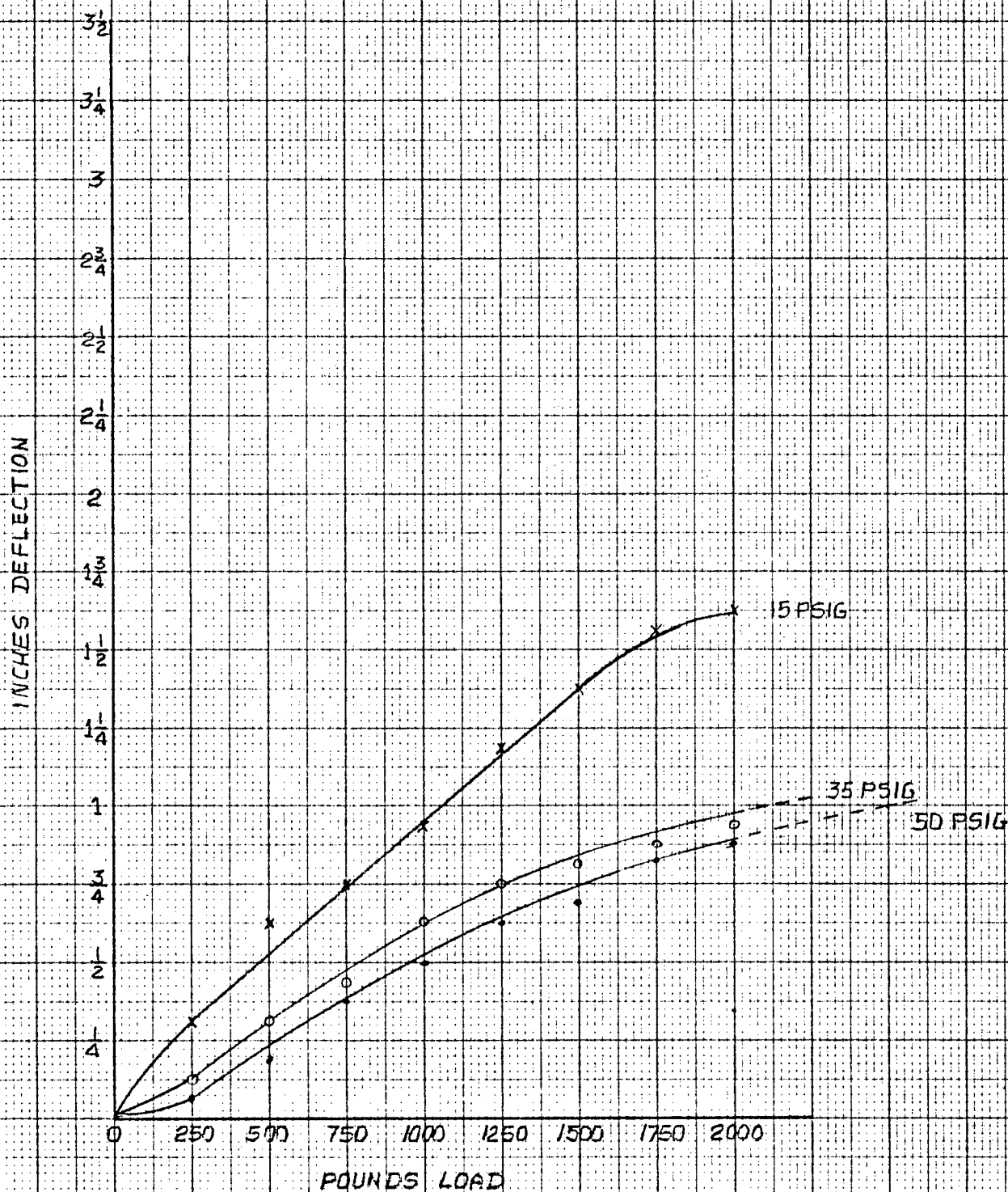
Project: 20-17-30

SPRING RATES
R2A-MILITARY NDCC
EXPERIMENTAL BIAS PLY
FIGURE NO. 37

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED



Nevada Automotive Test Center

Project: 20-17-30

SPRING RATE

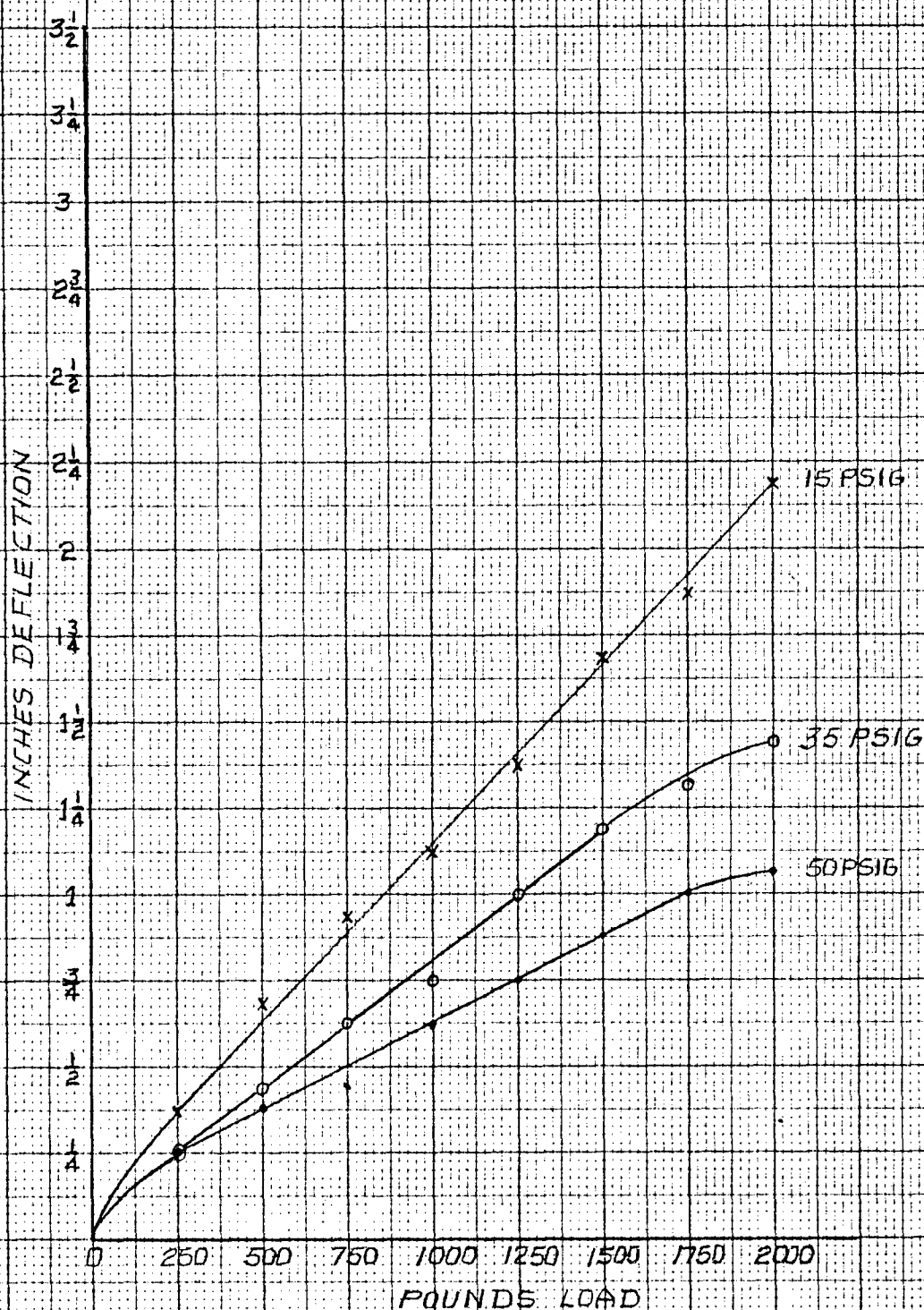
GROUP: A

FIGURE NO. 98

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED



Nevada Automotive Test Center

Project 20-17-30

SPRING RATE

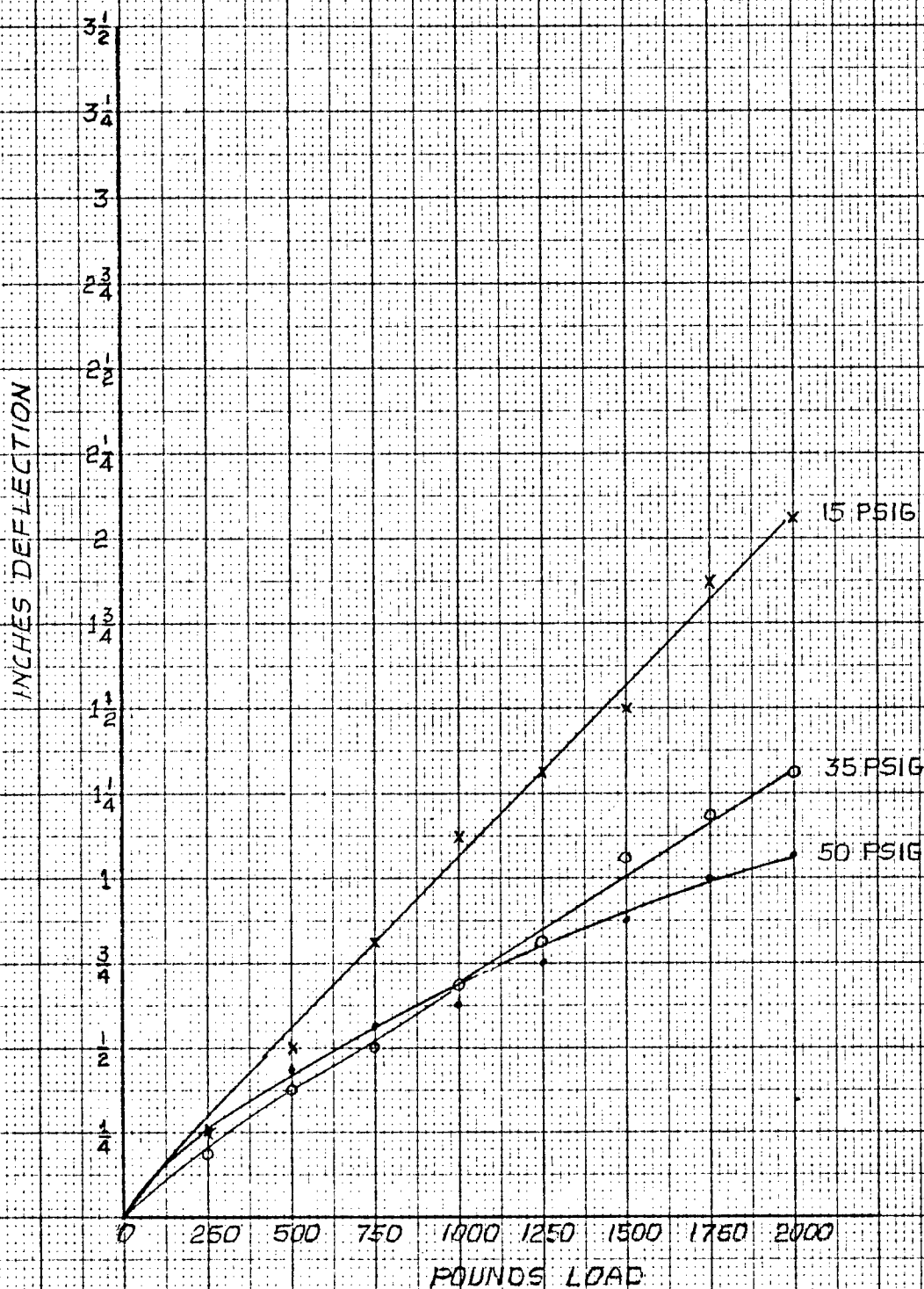
GROUP: B

FIGURE NO. 99

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED



Nevada Automotive Test Center

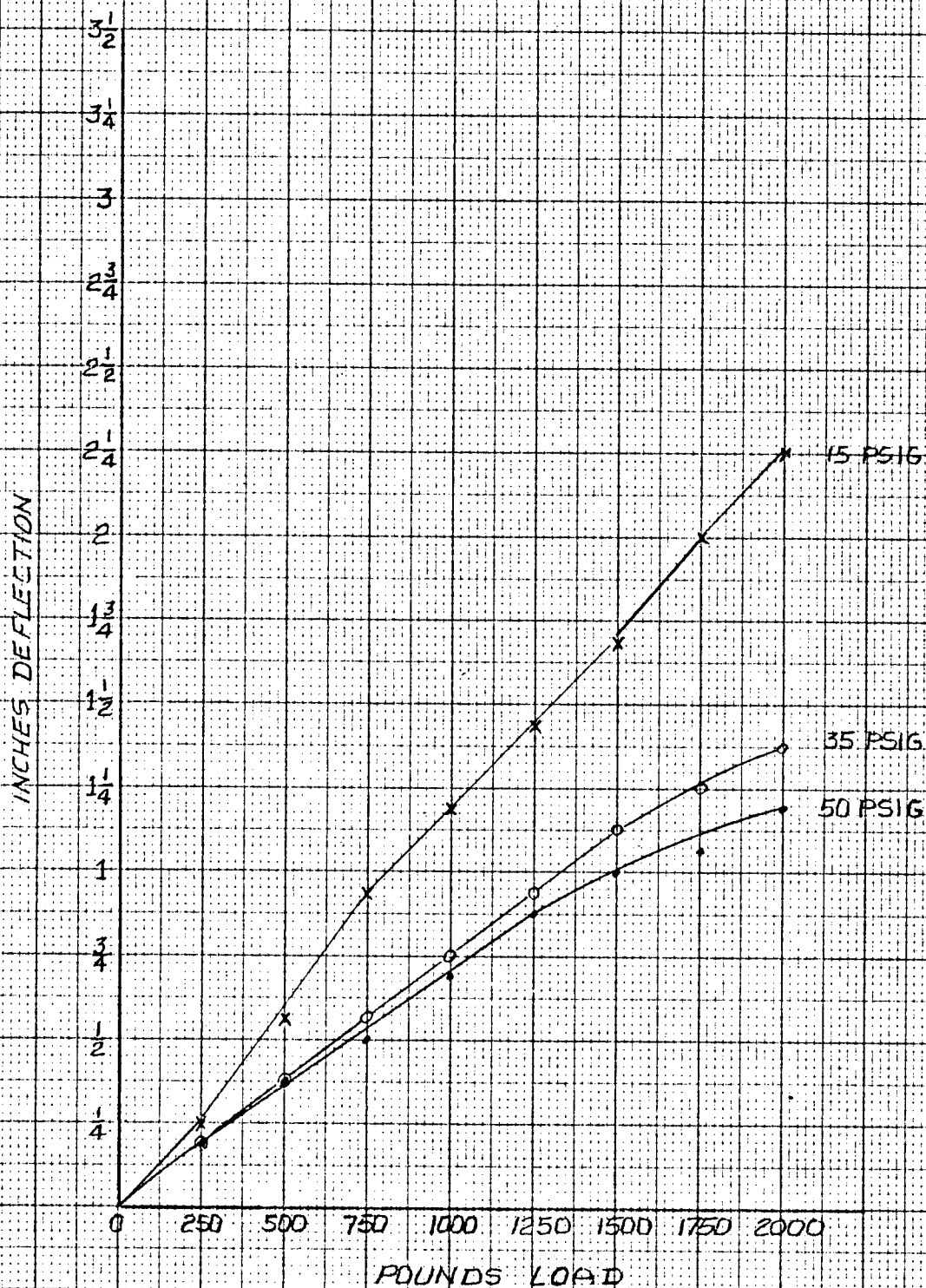
Project: 20-17-30

SPRING RATE
GROUP: C
FIGURE NO. 100

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED



Nevada Automotive Test Center

Project: 20-17-30

SPRING RATES

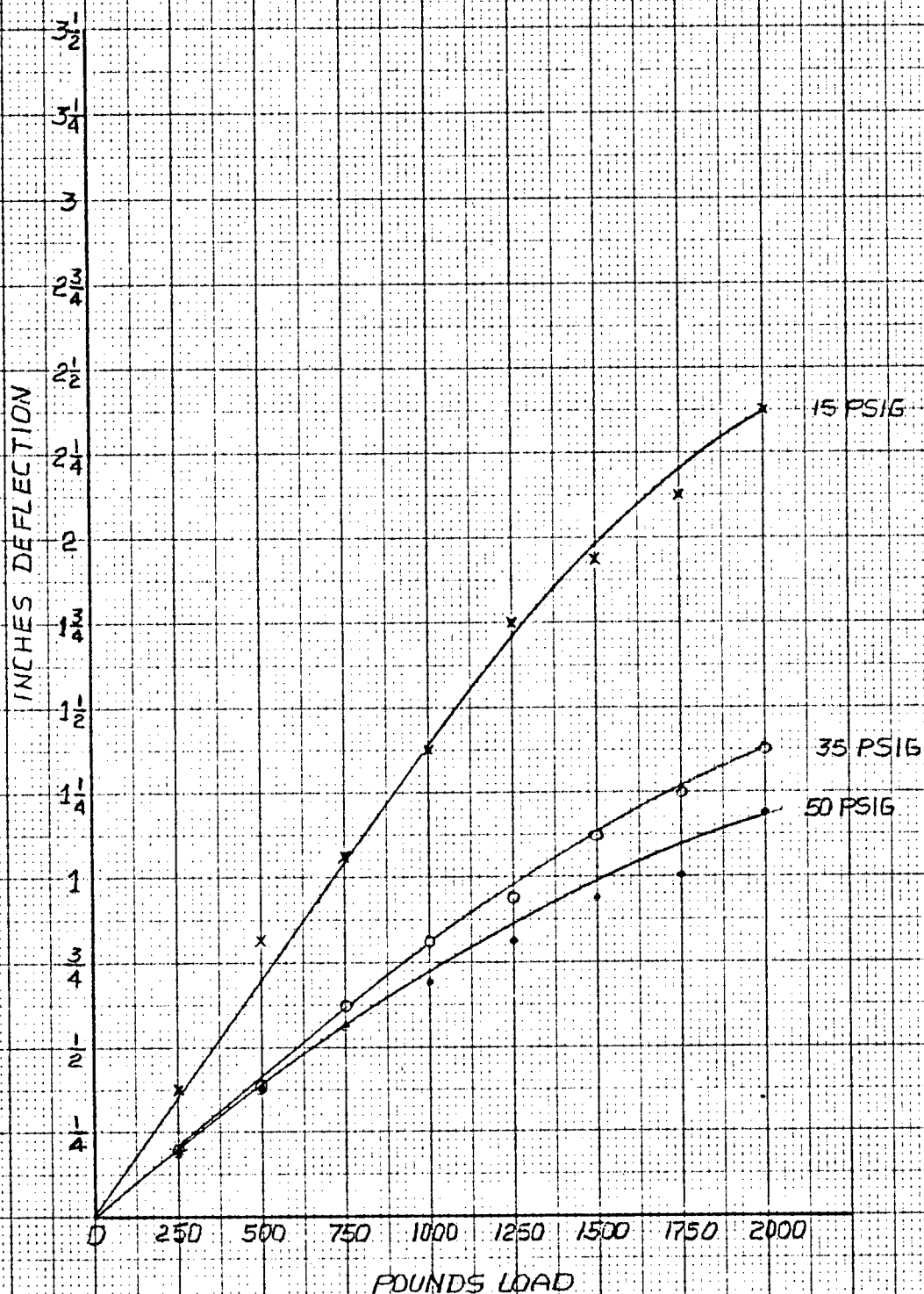
GROUP: D
FIGURE NO: 101

Location: PROVING GROUND

Date: 4-23-74

Test By: JED

Data By: JED



Nevada Automotive Test Center

Project: 20-17-30

SPRING RATES

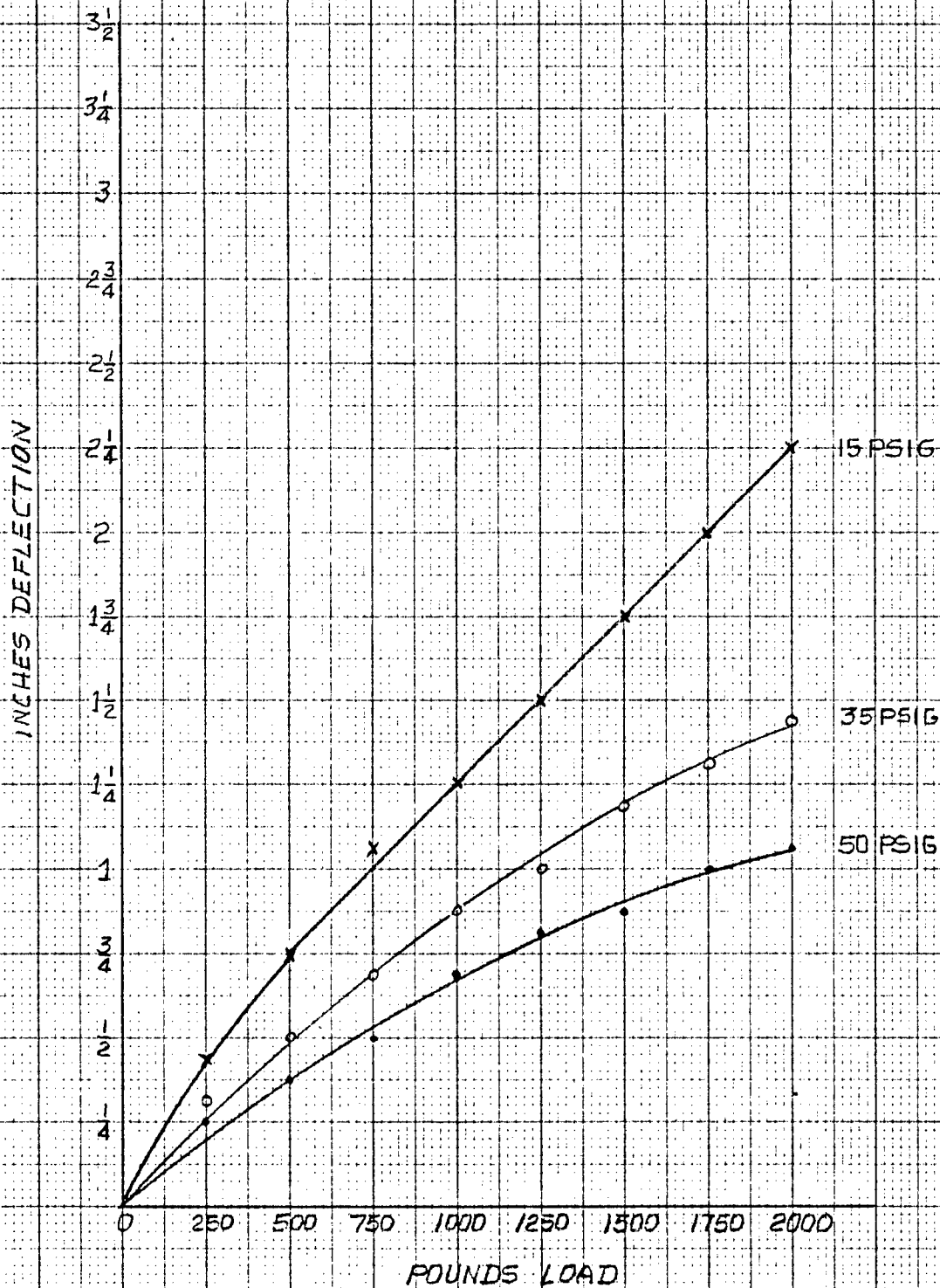
GROUP: E

FIGURE NO. 102

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED



Nevada Automotive Test Center

Project: 20-17-30

SPRING RATES

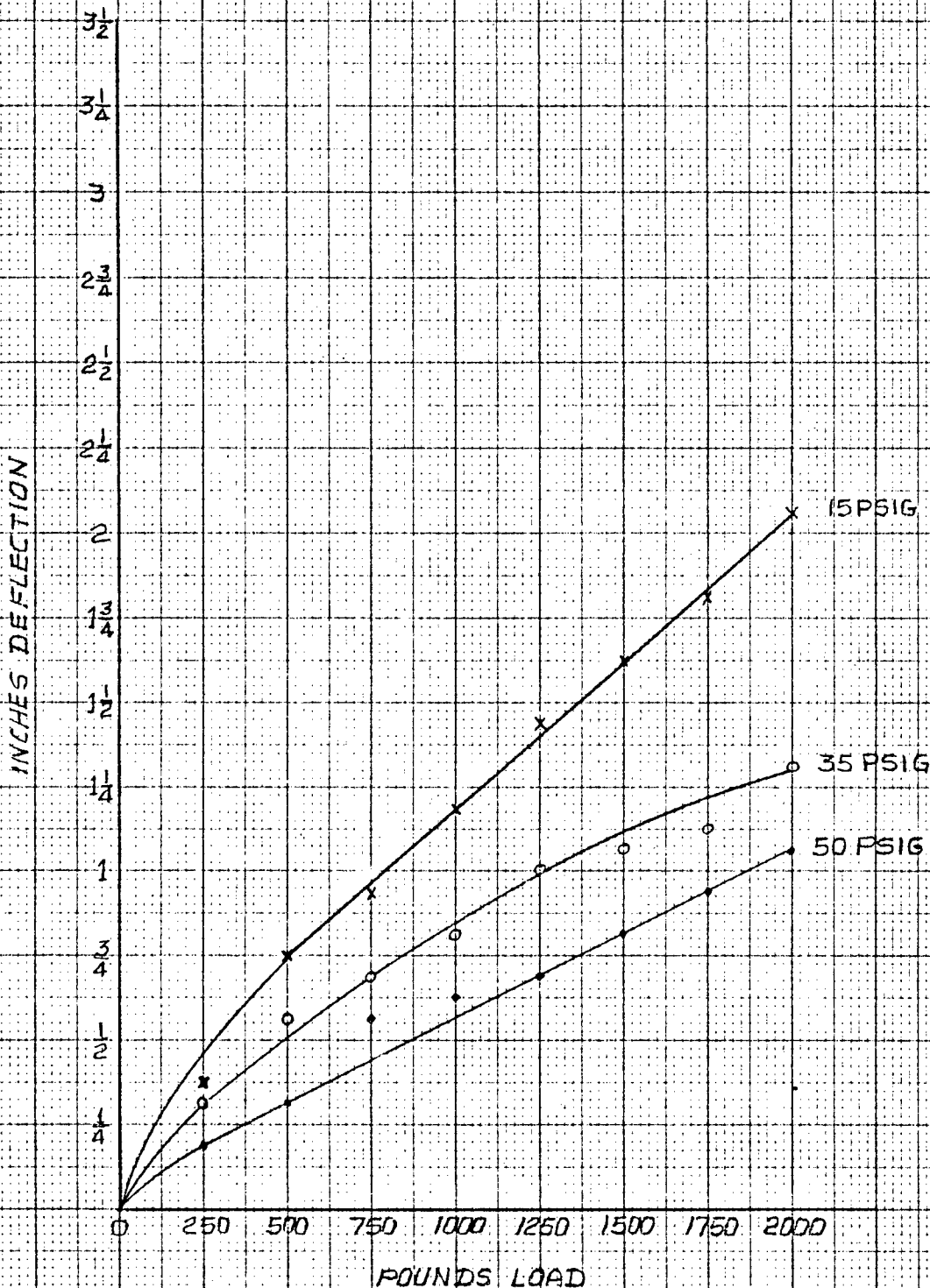
GROUP: F

FIGURE NO. 103

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED



Nevada Automotive Test Center

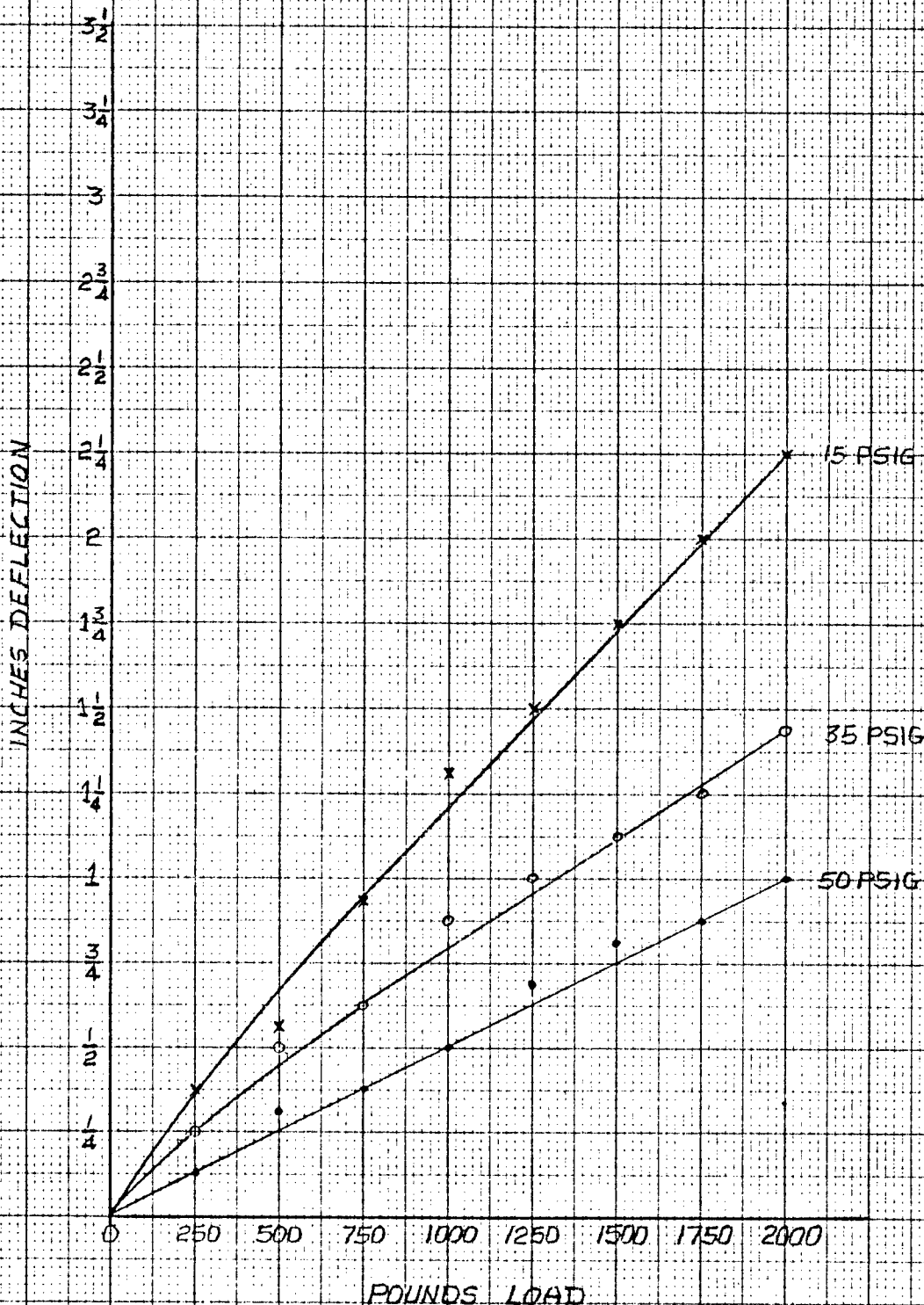
Project: 20-17-30

SPRING RATES
GROUP: G
FIGURE NO. 104

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED



Nevada Automotive Test Center

Project: 20-17-30

SPRING RATES

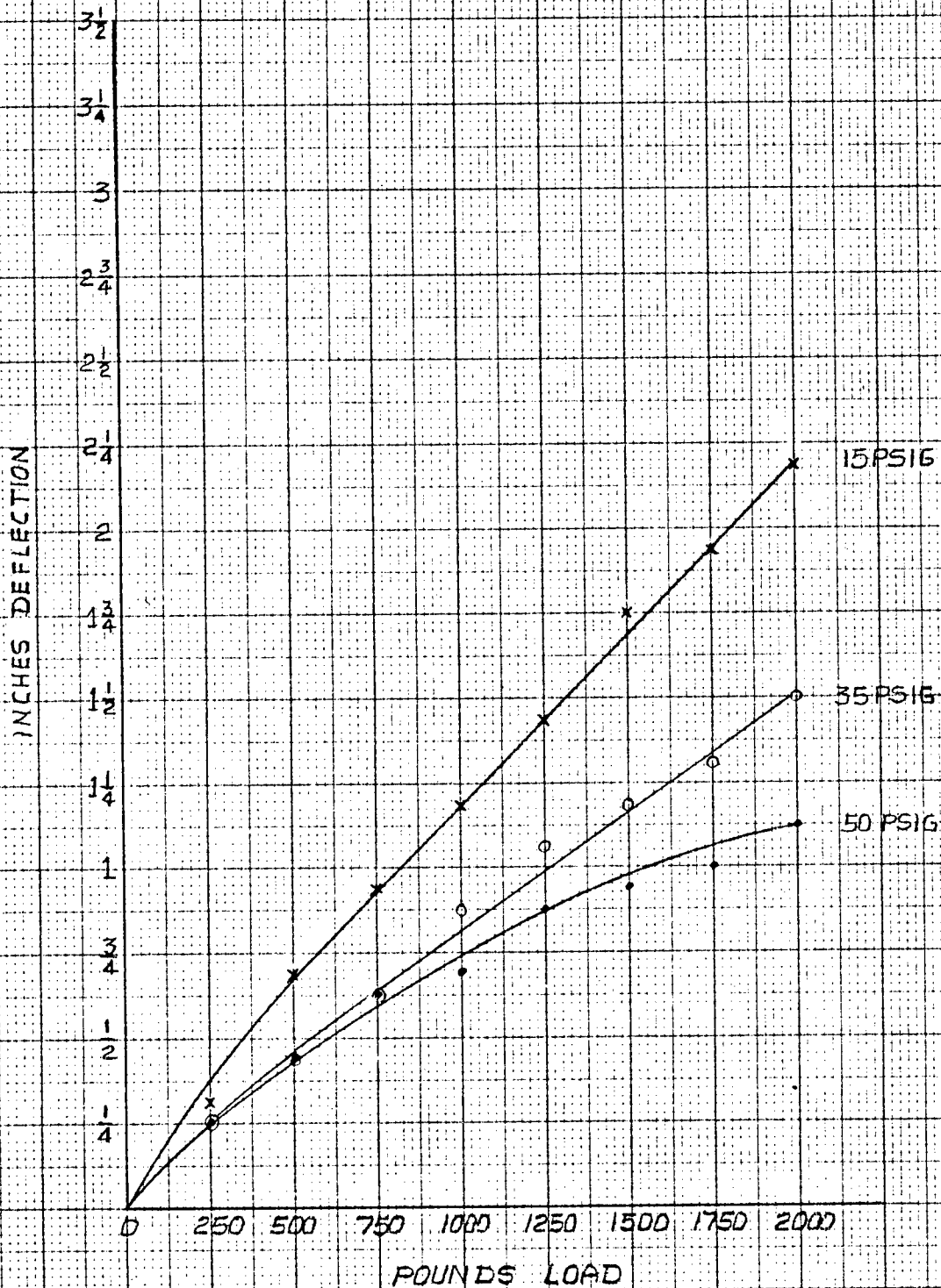
GROUP: J

FIGURE NO. 105

Location: PROVING GROUND

Date: 4-23-74 Test By: JED

Data By: JED



TEST DATA

Figure Nos. 106 through 109

"J" Turns - Wet Asphalt

Nevada Automotive Test Center

Project: 20-17-30

WET ASPHALT "J" TURN
4WHEEL DRIVE
60 PSIG INFLATION PRESSURE
90' ϕ RADIUS
FIGURE NO. 106

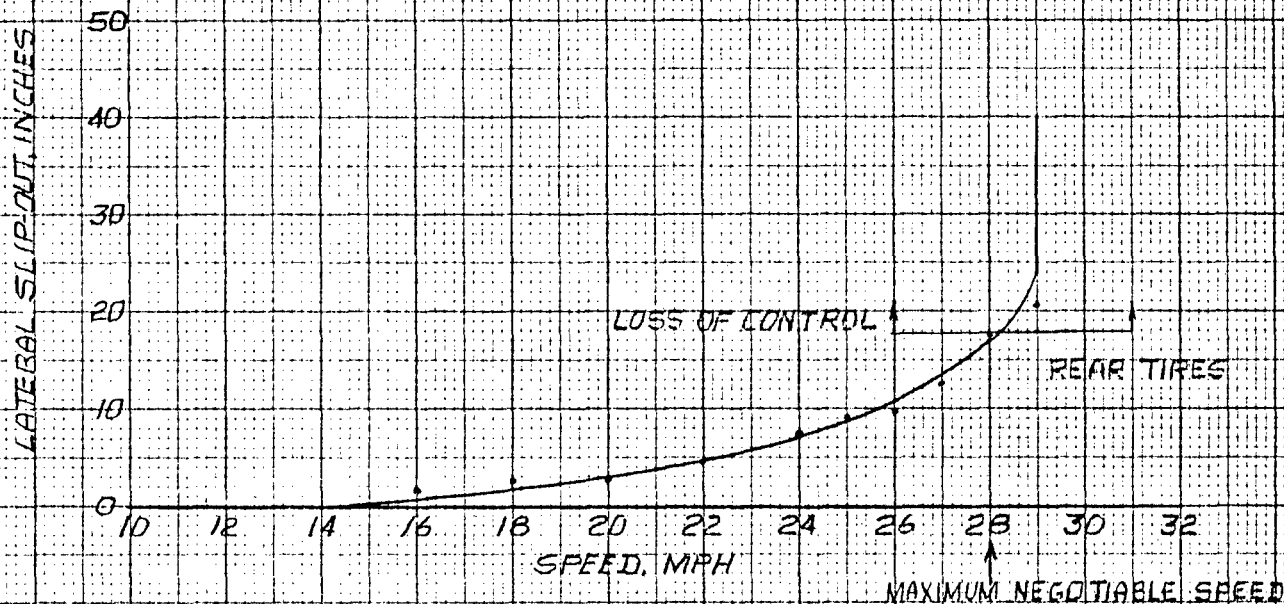
Location: PROVING GROUND

Date: 11-12-73

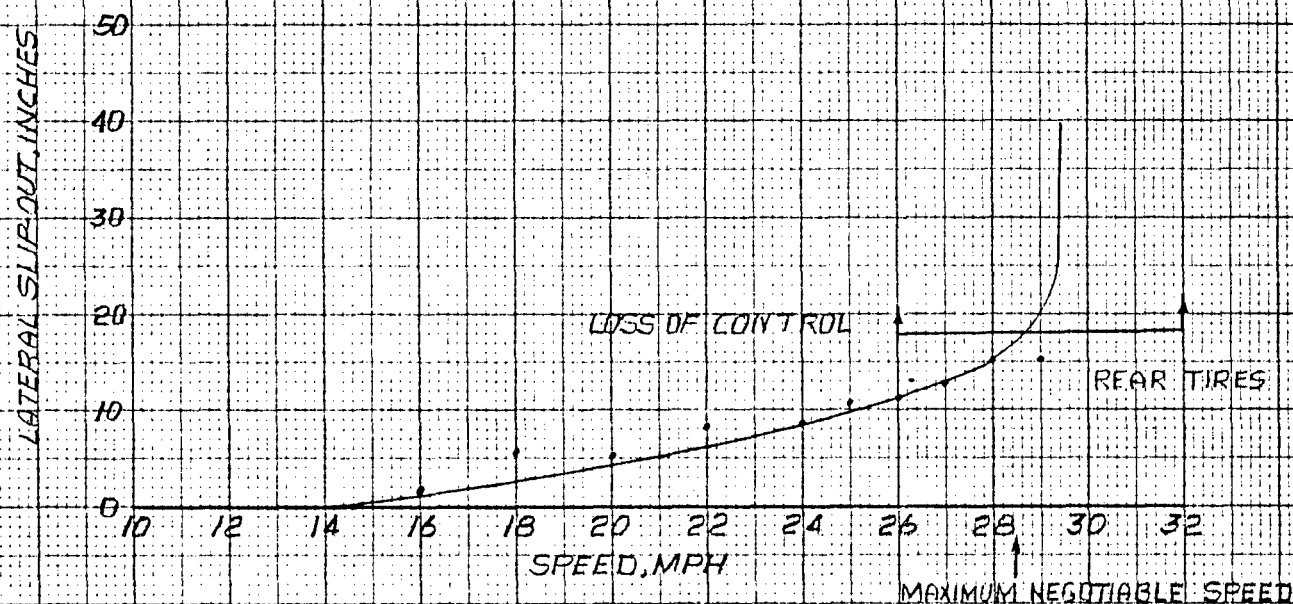
Test By: WHS

Data By: JED

GROUP A
AMB. 58° SURF. 60°



GROUP B
AMB. 52° SURF. 54°



Nevada Automotive Test Center

Project 20-17-30

WET ASPHALT "J" TURN
4 WHEEL DRIVE

50 PSIG INFLATION PRESSURE

90' ϕ RADIUS

FIGURE NO. 107

Location: PROVING GROUND

Date: 11-12-73 Test By: WHS

Data By: JED

GROUP C
AMB. 47° SURF. 50°

LATERAL SLIP-OUT, INCHES

50
40
30
20
10
0

10 12 14 16 18 20 22 24 26 28 30 32

SPEED, MPH

LOSS OF CONTROL

REAR TIRES

MAXIMUM NEGOTIABLE SPEED

GROUP D
AMB. 43° SURF. 40°

LATERAL SLIP-OUT, INCHES

50
40
30
20
10
0

10 12 14 16 18 20 22 24 26 28 30 32

SPEED, MPH

LOSS OF CONTROL

REAR TIRES

MAXIMUM NEGOTIABLE SPEED

Nevada Automotive Test Center

Project: 20-17-30

WET ASPHALT "J" TURN
4 WHEEL DRIVE
50 PSIG INFLATION PRESSURE
90' ϕ RADIUS
FIGURE NO. 108

Location: PROVING GROUND

Date: 11-13-73 Test By: WHS

Data By: JED

GROUP E
AMB. 57° SURF. 60°

LATERAL SLIP-OUT, INCHES

50
40
30
20
10
0

10 12 14 16 18 20 22 24 26 28 30 32

SPEED, MPH

LOSS OF CONTROL

REAR TIRES

MAXIMUM NEGOTIABLE SPEED

GROUP F
AMB. 61° SURF. 59°

LATERAL SLIP-OUT, INCHES

50
40
30
20
10
0

10 12 14 16 18 20 22 24 26 28 30 32

SPEED, MPH

LOSS OF CONTROL

REAR WHEELS

MAXIMUM NEGOTIABLE SPEED

Nevada Automotive Test Center

Project: 20-17-30

WET ASPHALT "J" TURN
4 WHEEL DRIVE
50 PSIG INFLATION PRESSURE
90' ϕ RADIUS
FIGURE NO. 109

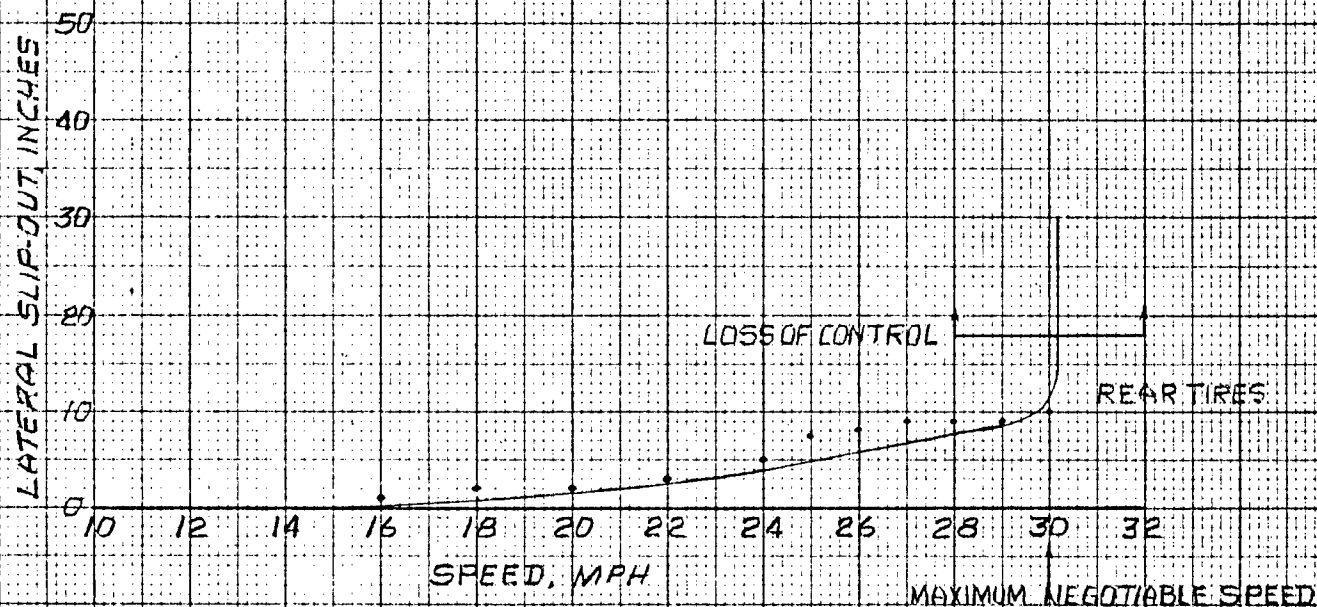
Location: PROVING GROUND

Date: 11-13-73

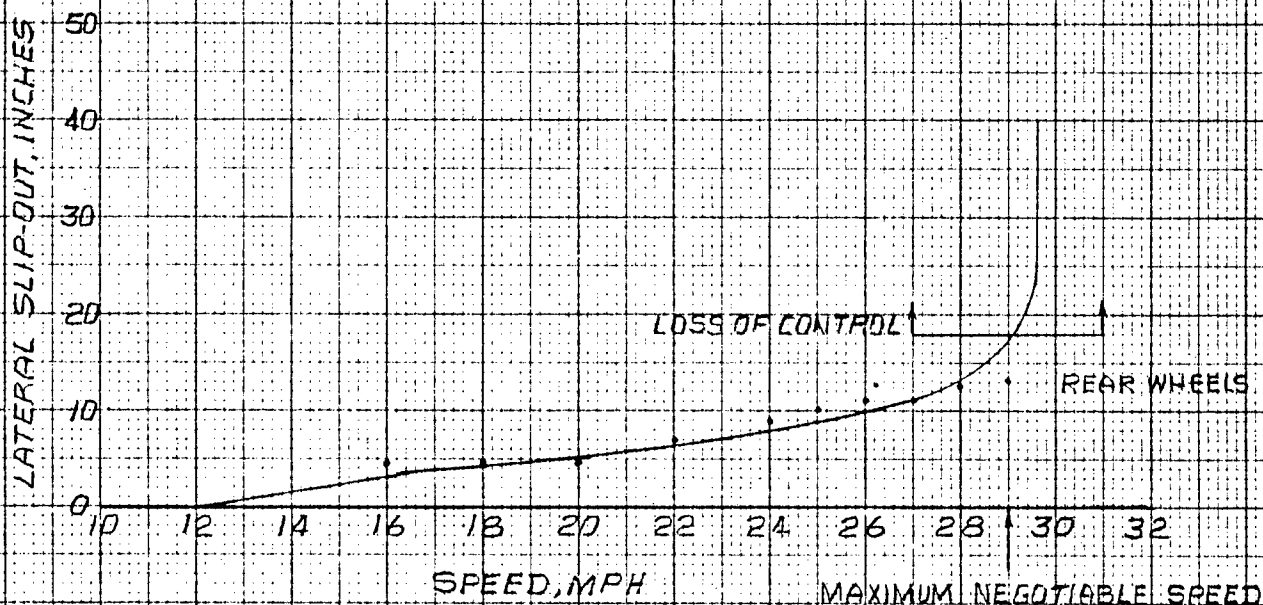
Test By: WHS

Data By: JED

GROUP G
AMB. 52° SURF. 55°



GROUP J
AMB. 58° SURF. 61°



TEST DATA

Figure Nos. 110 through 113

"S" Turns - Wet Asphalt

Nevada Automotive Test Center

Project: 20-17-30

WET ASPHALT "S" TURN

4 WHEEL DRIVE

60 PSI INFLATION PRESSURE

90° RADIUS

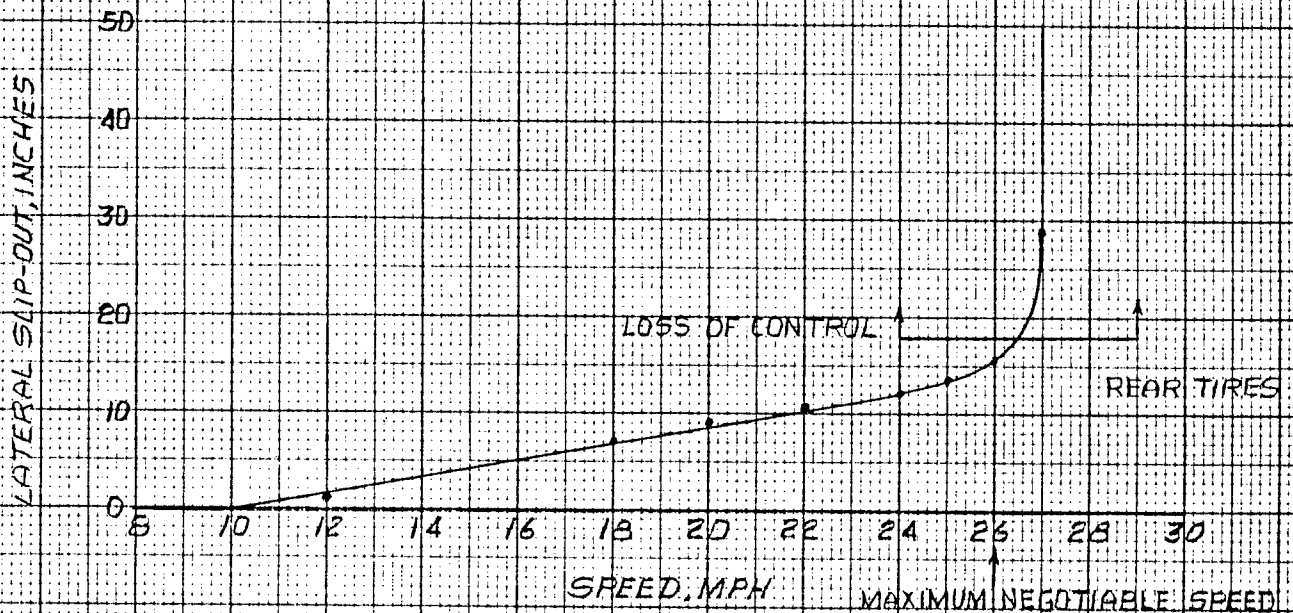
FIGURE NO. 110

Location: PROVING GROUND

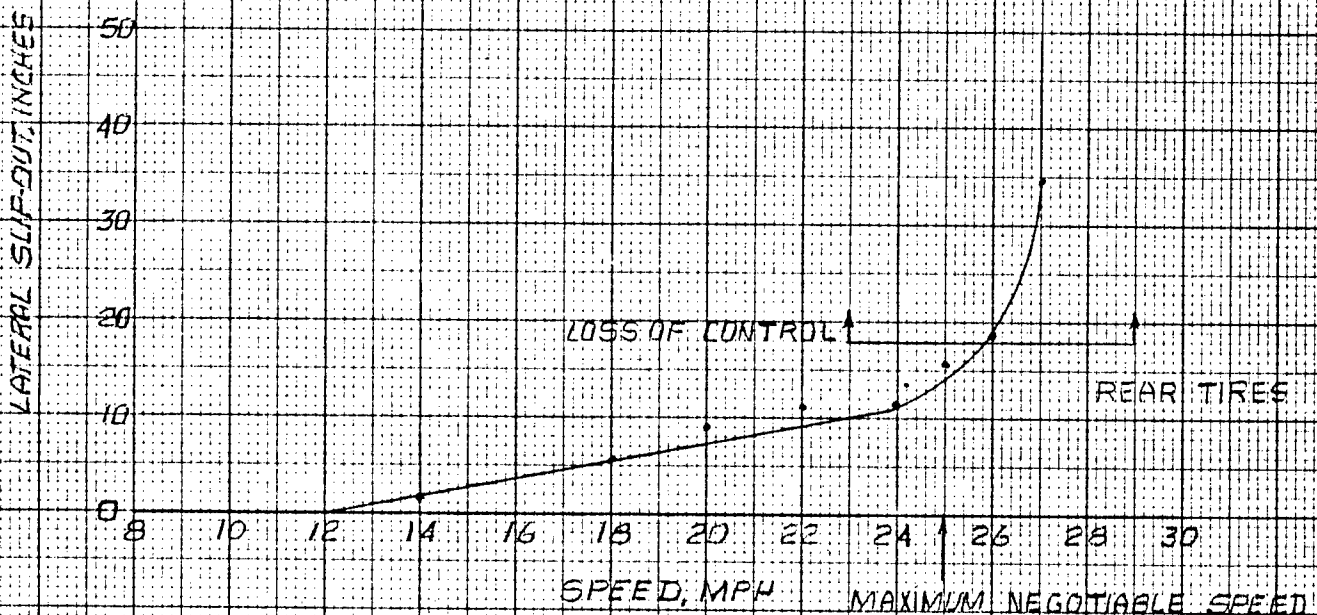
Date: 11-13-73 Test By: WHS

Data By: JED

GROUP A
AMB. 54° SURF. 54°



GROUP B
AMB. 54° SURF. 47°



Nevada Automotive Test Center

Project 20-17-30

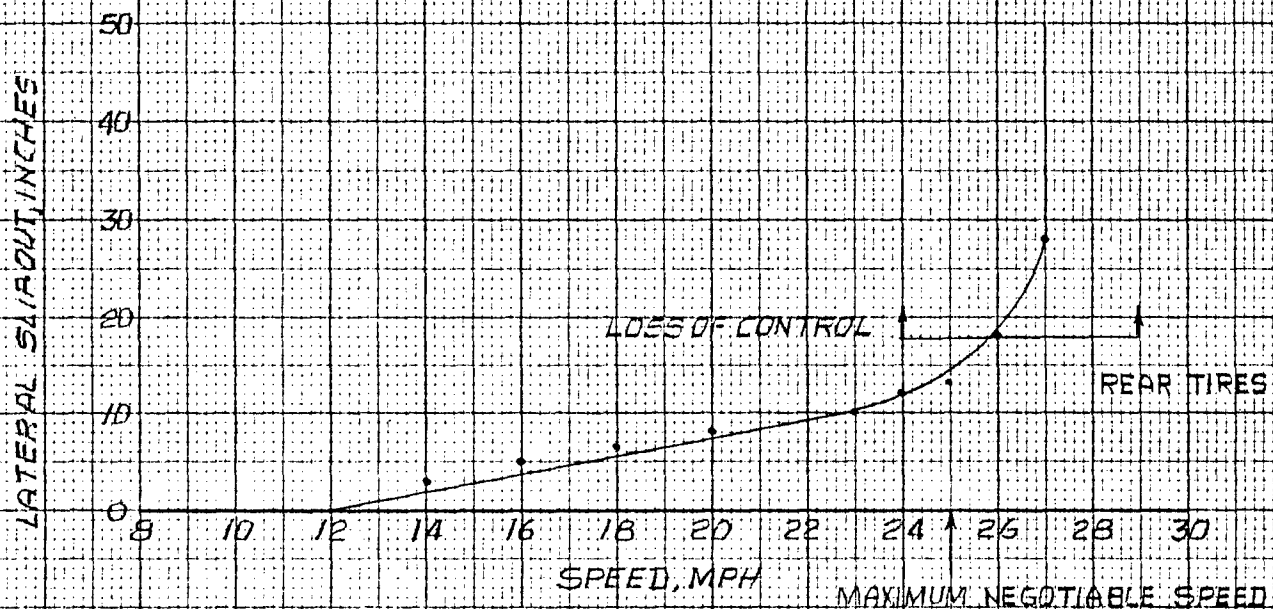
WET ASPHALT "S" TURN
4WHEEL DRIVE
50PSIG INFLATION PRESSURE
50' ϕ RADIUS
FIGURE NO. III

Location: PROVING GROUND

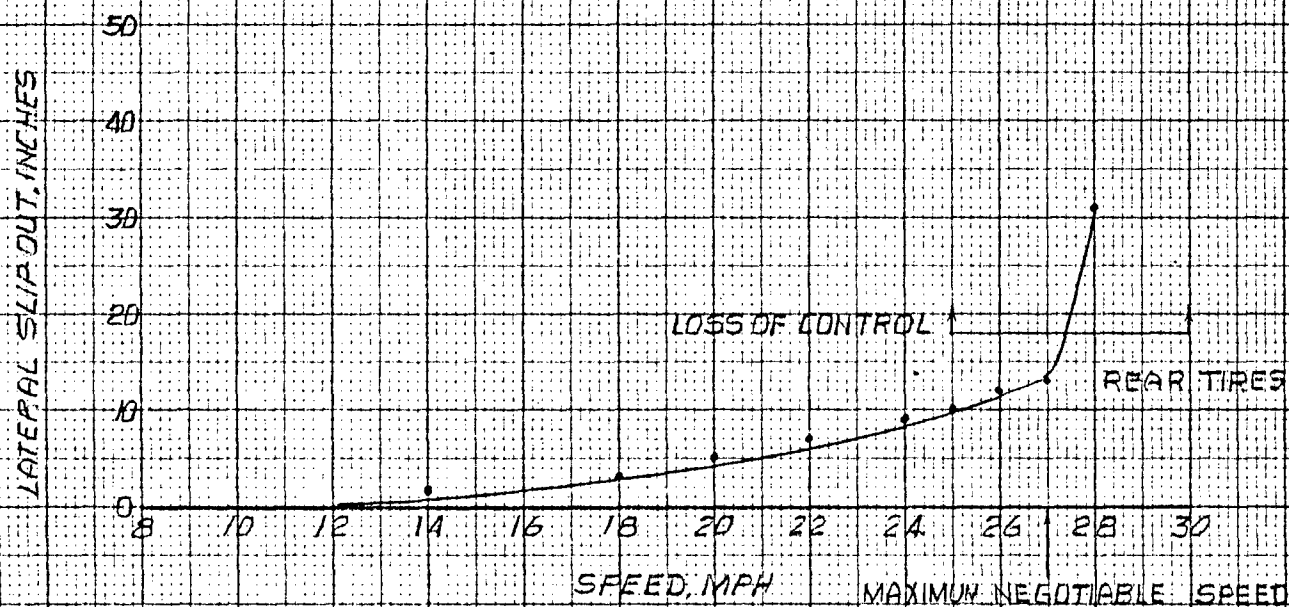
Date: 11-13-73 Test By: WHS

Data By: JED

GROUP C
AMB. 54° SURF. 45°



GROUP D
AMB. 42° SURF. 43°



Nevada Automotive Test Center

Project: 20-17-30

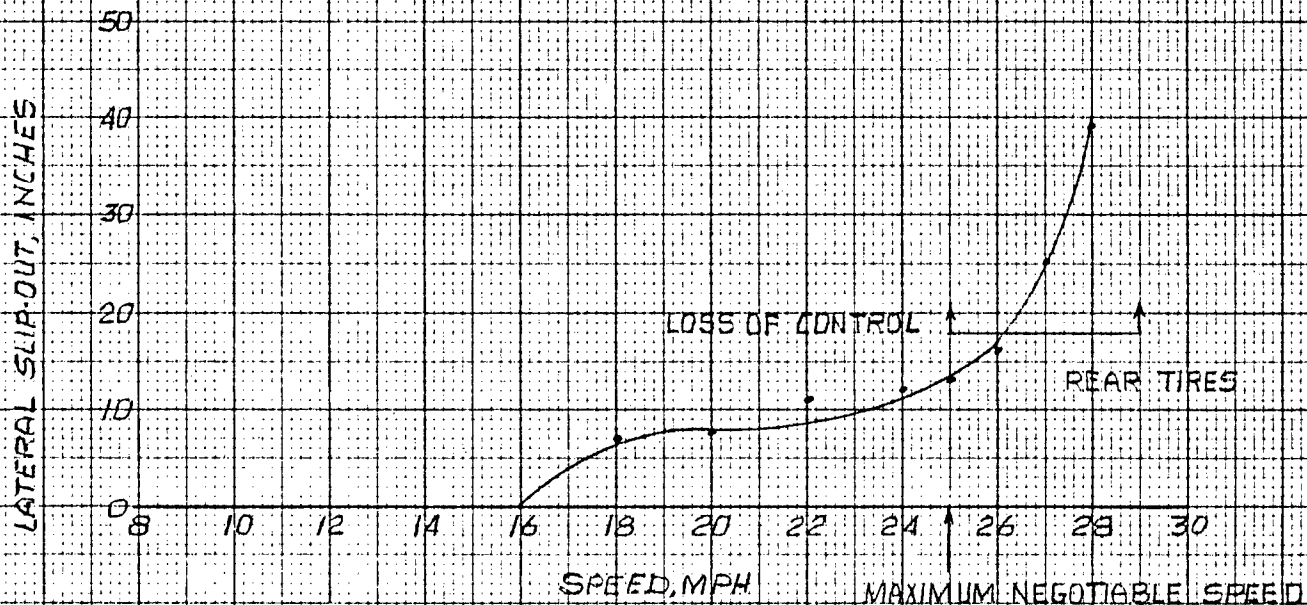
WET ASPHALT 'S' TURN
4 WHEEL DRIVE
50 PSIG INFLATION PRESSURE
90° TURN
FIGURE NO. 112

Location: PROVING GROUND

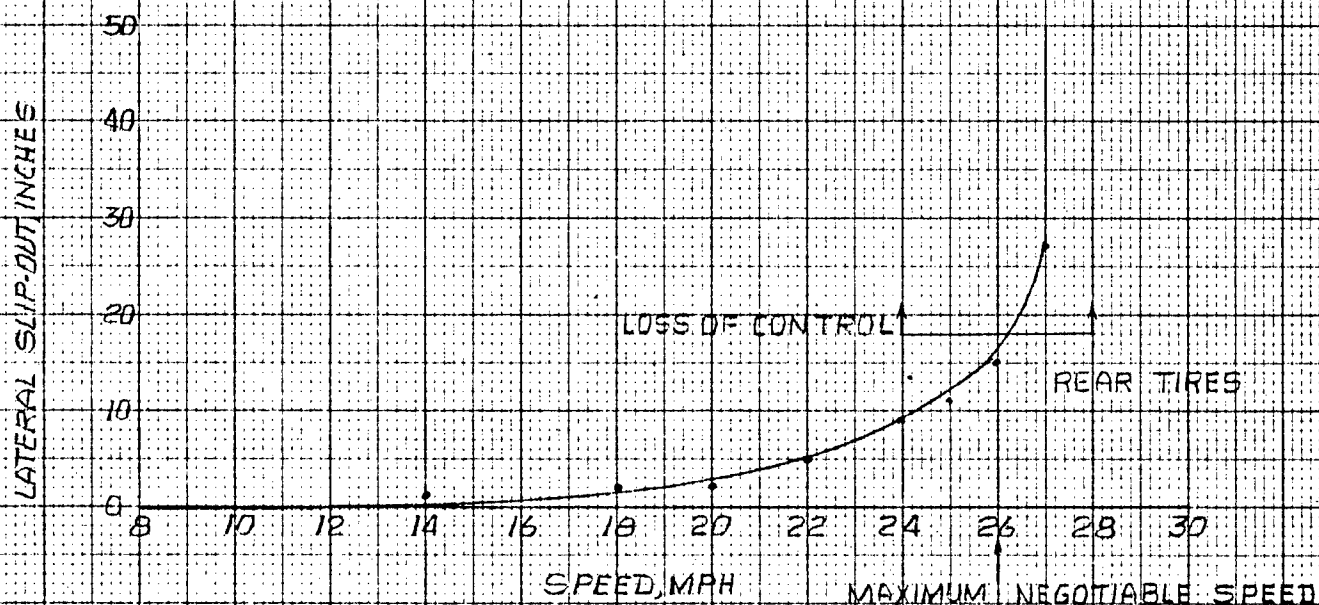
Date: 11-14-73 Test By: WHS

Data By: JED

GROUP E
AMB. 42° SURF. 50°



GROUP F
AMB. 43° SURF. 50°



Nevada Automotive Test Center

Project 20-17-30

WET ASPHALT "S" TURN
4 WHEEL DRIVE
50 PSI G INFLATION PRESSURE
90' RADIUS
FIGURE NO. 113

Location: PROVING GROUND

Date 11-13-73 Test By: WHS

Data By: JED

GROUP G
AMB. 50° SURF. 51°

LATERAL SLIP-OUT, INCHES

50
40
30
20
10
0

8 10 12 14 16 18 20 22 24 26 28 30

SPEED, MPH

MAXIMUM NEGOTIABLE SPEED

LOSS OF CONTROL

REAR TIRES

GROUP J
AMB. 50° SURF. 52°

LATERAL SLIP-OUT, INCHES

50
40
30
20
10
0

8 10 12 14 16 18 20 22 24 26 28 30

SPEED, MPH

MAXIMUM NEGOTIABLE SPEED

LOSS OF CONTROL

REAR TIRES

APPENDIX I
Soil Analysis



HARDING-LAWSON ASSOCIATES
1030 Matley Lane, Reno, Nevada 89502 • (702) 329-6123

Consulting Engineers and Geologists

LETTER OF TRANSMITTAL

TO: Hodges Transportation, Inc.
P. O. Box 234
Carson City, Nevada 89701

ATTENTION: Mr. Robert Torp

SUBJECT: Test Data for Dayton, Nevada and Sand Mt. Test Sites

OUR JOB NO. 7138,001.05; Hodges Transportation Project No. 20-17-30

Transmitted herewith ~~is~~/are the following:

Plate 1 - Particle Size Analysis (and organic content) for samples from
Dayton, Nevada and Sand Mt. Test Sites; Plate 2 - Plasticity Chart
for sample from Dayton Test Site; Plate 3 - Field Moisture-Density and
Remolded Triaxial Compression Test Data, for samples from Dayton
Test Site.

~~These~~ ~~is~~/are for

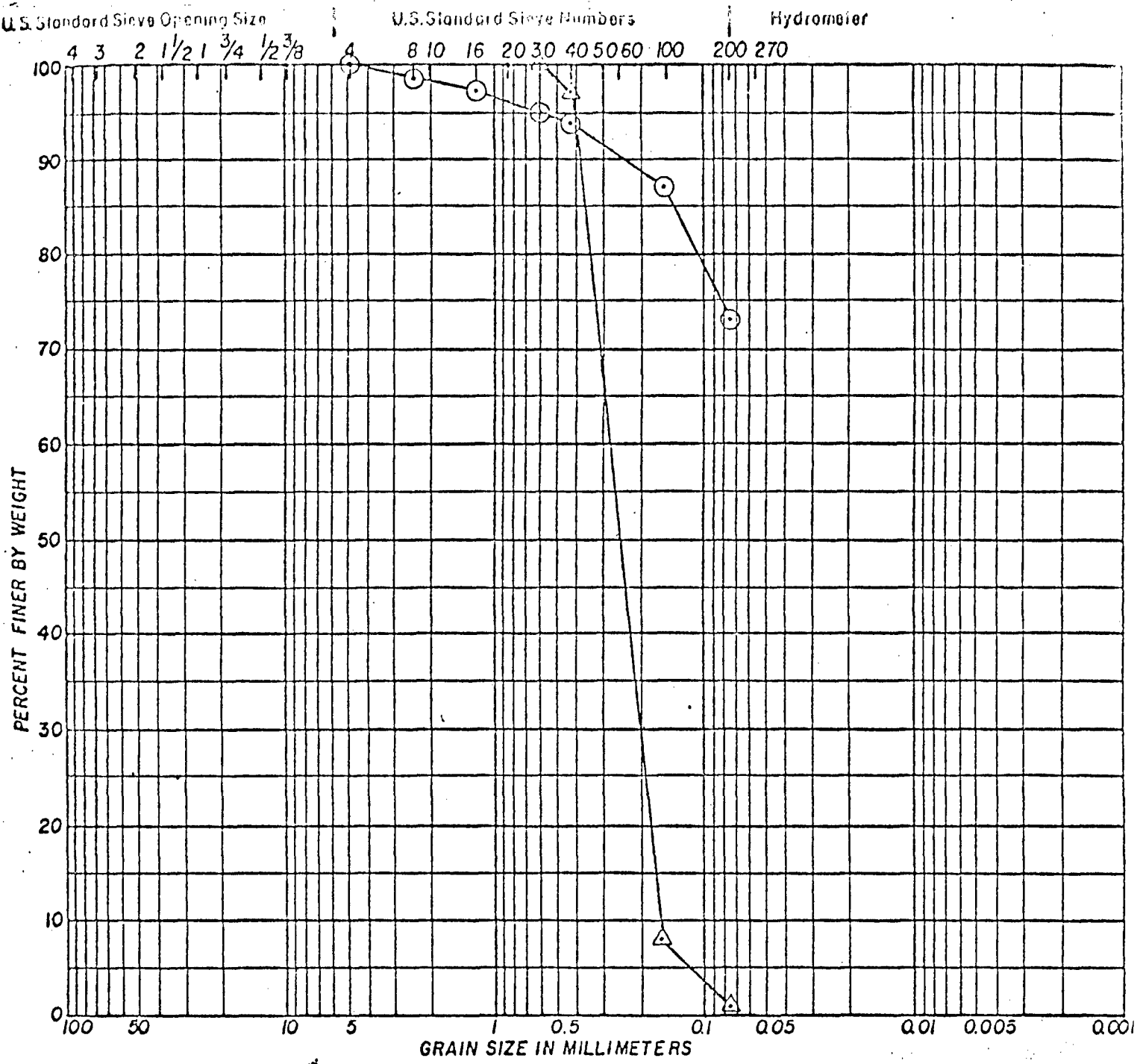
- ☒ Your use and need not be returned.
- ☐ Your use; please return them when you have finished.
- ☐ Your review; please return them with your comments.

HARDING - LAWSON ASSOCIATES

By Henry T. Taylor
Henry T. Taylor

Date November 7, 1973


cc: _____

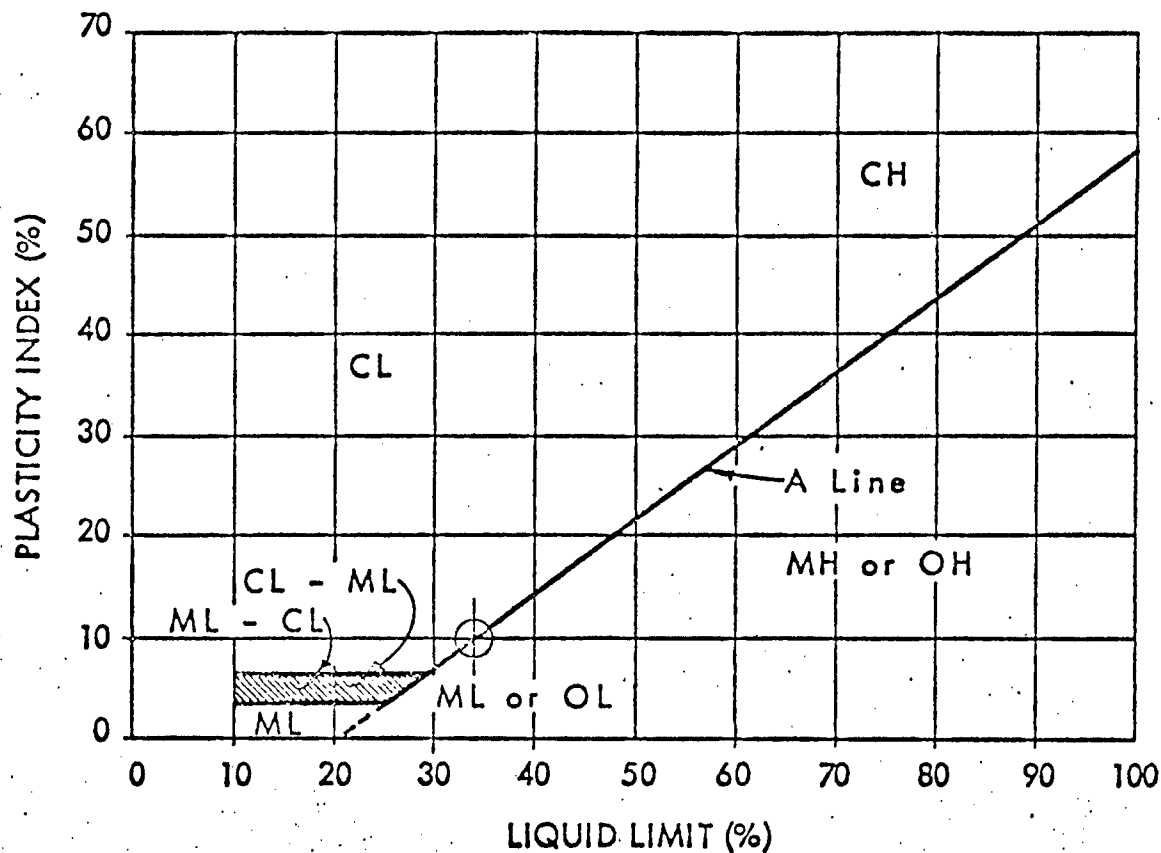


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Sample Source	Classification
○	Dayton Test Site	BROWN SANDY SILTY CLAY (CL) *Organic Content = 0.5%
△	Sand Mountain Test Site	TAN SAND (SP) **Organic Content = 0.0%

*Based on the dry weight of the total sample using the loss by ignition test method. **Using the organic impurities in sand, ASTM C 40 Test Method.

HARDING-LAWSON ASSOCIATES  Consulting Engineers and Geologists		PARTICLE SIZE ANALYSIS HODGES TRANSPORTATION Dayton, Nevada and Sand Mountain Test Sites	PLATE 1
Job No. 7138,001.05		Appr. 2/1/73 Date 11/9/73	



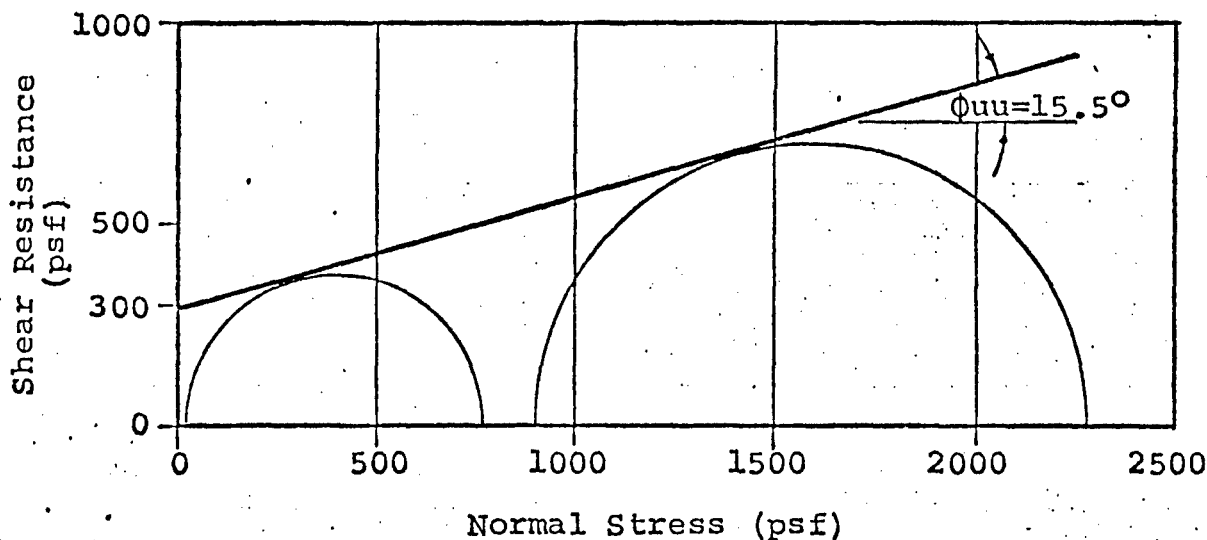
Symbol	Classification and Source	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
	BROWN SANDY SILTY CLAY (CL) Dayton Test Site	33.5	23.5	10.0	73
HARDING - LAWSON ASSOCIATES Consulting Engineers and Geologists		PLASTICITY CHART HODGES TRANSPORTATION Test Site Near Dayton, Nevada			PLATE 2
Job No. 7138,001.05		Appr. <u>ML/jy</u> Date <u>11/9/73</u>			

FIELD SAMPLE MOISTURE - DENSITY TEST RESULTS

Sample	Classification	Moisture Content Percent (%)	Dry Density (pcf)	Average Dry Density (pcf)
A*	BROWN SANDY SILTY CLAY (CL)	33.1	85	85.5
B*	BROWN SANDY SILTY CLAY (CL)	33.3	86	

*Samples obtained from Dayton, Nevada Test Site when they were watered to near liquid condition on October 25, 1973.

REMOLED TRIAXIAL COMPRESSION (Unconsolidated-Undrained) TEST RESULTS



Sample	Classification	Moisture Content (%)	Dry Density (pcf)	Confining Stress (psf)	1/2 Deviator Stress (psf)
C	BROWN SANDY SILTY CLAY (CL)	23.9	85	0	381
D	BROWN SANDY SILTY CLAY (CL)	23.8	85	864	711

The above triaxial compression test results show that, for the unconsolidated-undrained condition, samples remolded to near the plastic limit moisture content (23.5%, about 68% saturation) and to near the dry density of the field samples A and B have an angle of internal friction (shearing resistance) $= \phi = 15.5$ degrees and C-value for undrained shear = 300 psf.

HARDING-LAWSON ASSOCIATES



Consulting Engineers and Geologists

FIELD MOISTURE - DENSITY AND
REMOLED TRIAXIAL COMPRESSION
TEST RESULTS

PLATE

3

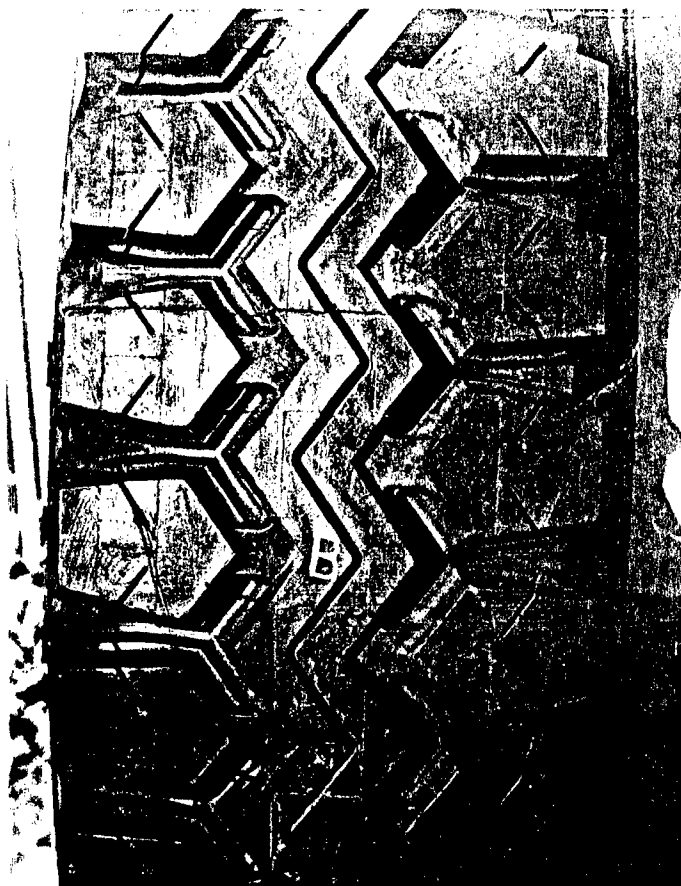
Job No. 7138,001.05 Appr. 2/11 Date 11/12/73

HODGES TRANSPORTATION TEST
SITE NEAR DAYTON, NEVADA

Appendix II
Photographic Supplement



GROUP A
Tread Pattern



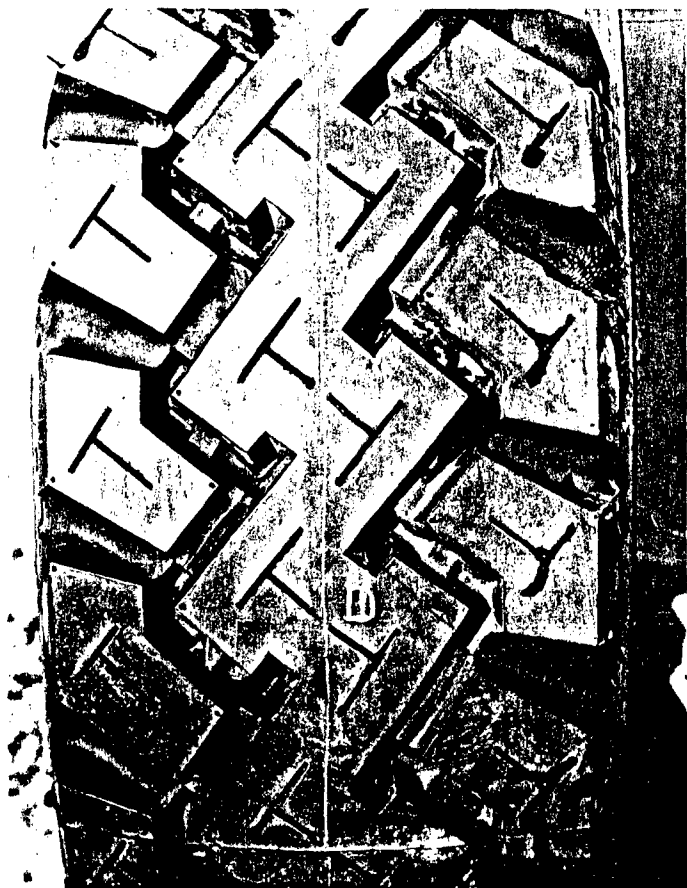
GROUP B

Tread Pattern



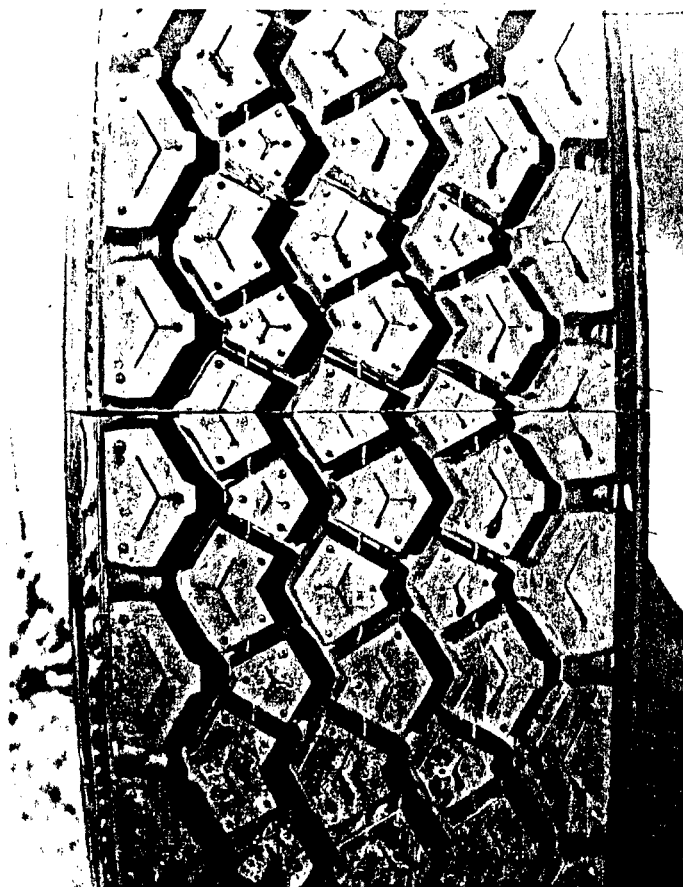
GROUP C

Tread Pattern



GROUP D

Tread Pattern



GROUP E

Tread Pattern



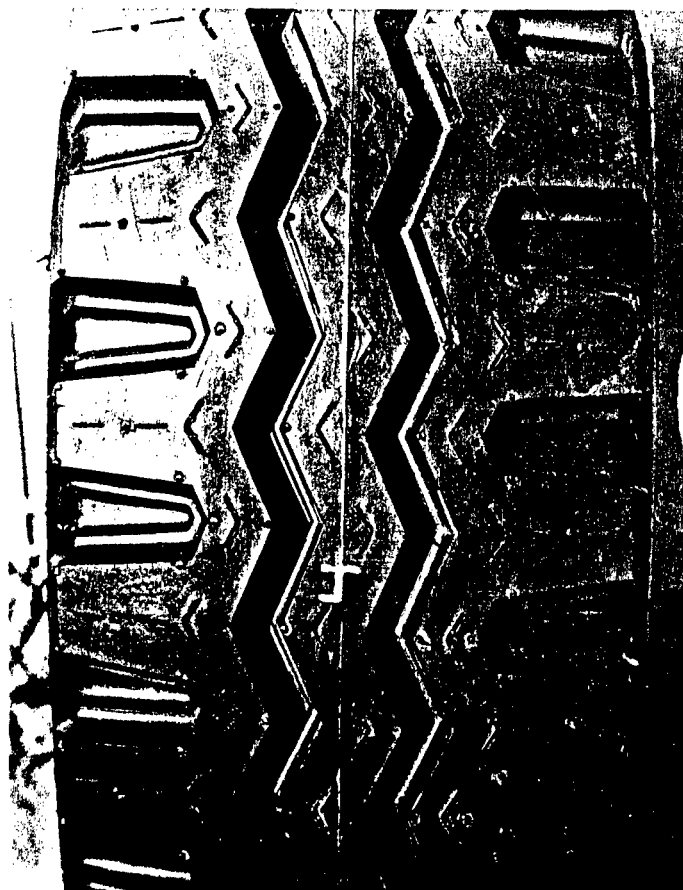
GROUP F

Tread Pattern



GROUP G

Tread Pattern

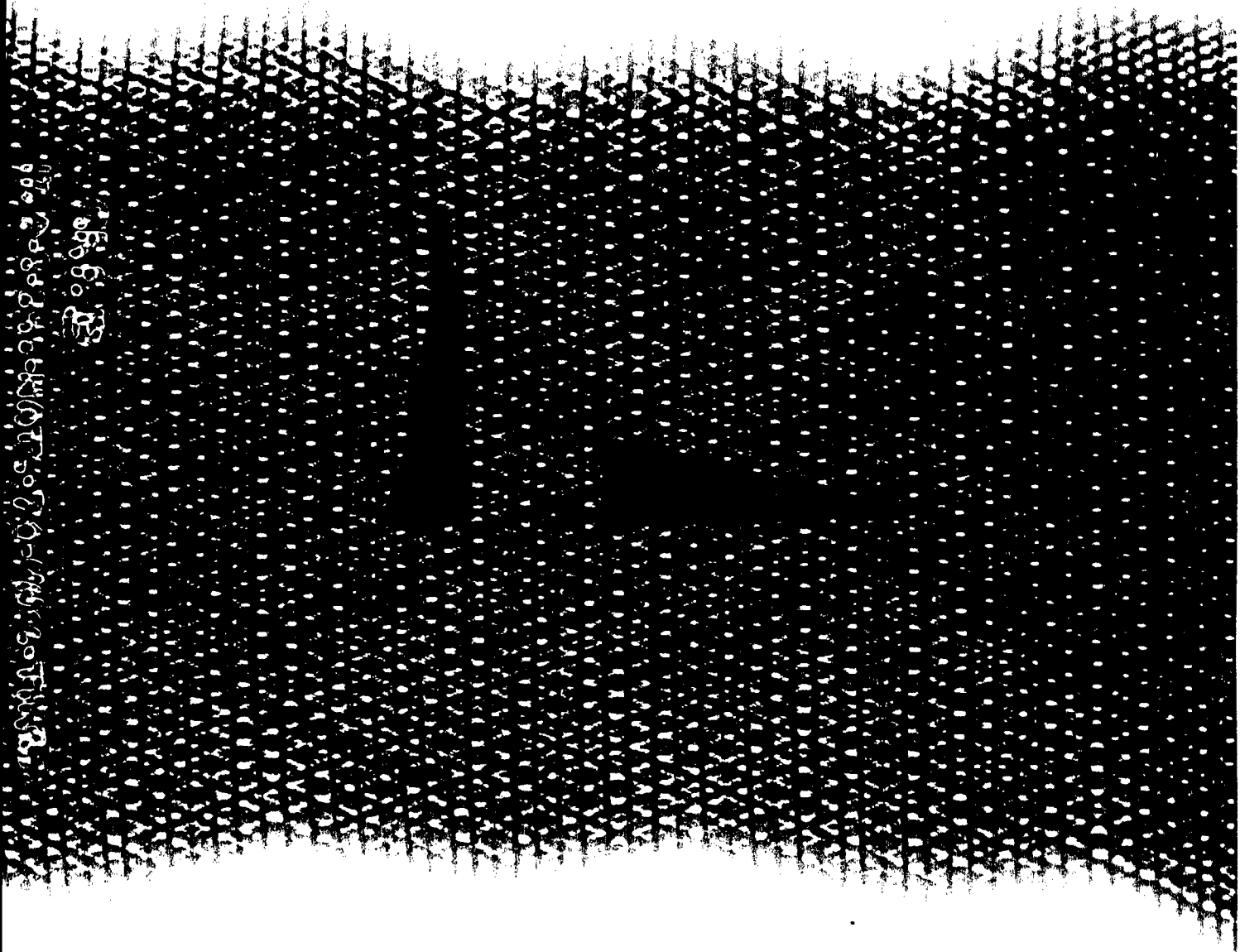


GROUP J

Tread Pattern

05/11/00

GRAA



GRF.B

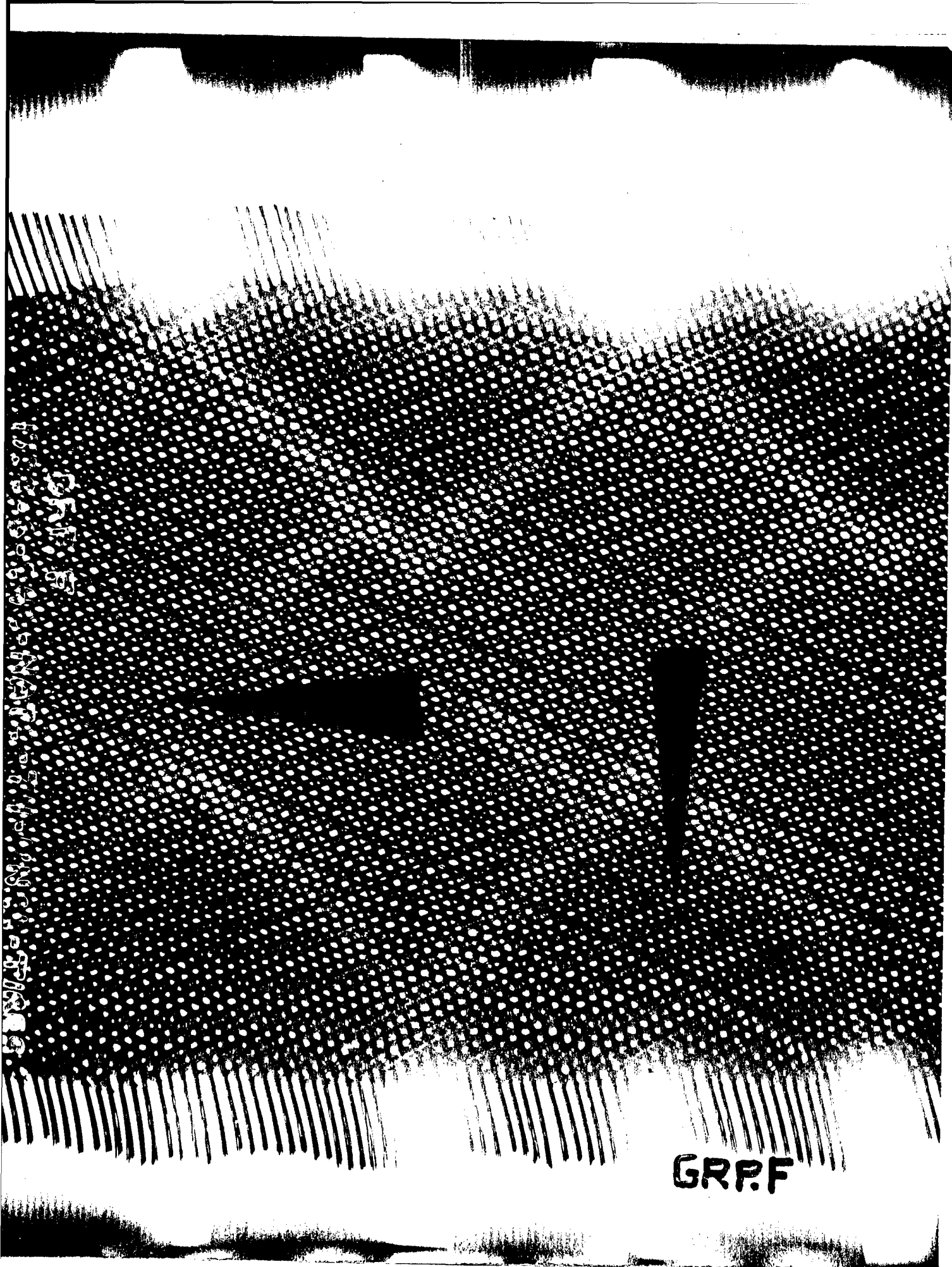
The image is a high-contrast, black and white scan of a textured surface, likely a book cover or endpaper. The majority of the frame is filled with a dense, repeating pattern of small, dark, irregular shapes against a lighter background, creating a complex, woven or mesh-like appearance. On the far left, there is a vertical strip of lighter, more uniform material, possibly a hinge or a different section of the cover. Within this strip, there are some faint, illegible markings that appear to be numbers or characters, possibly '100' and '101' stacked vertically. The overall image has a grainy, high-contrast quality typical of a photocopy or a low-quality scan.

五

GRFI

[illegible]

GRRE



GR.F

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1-800-666-6666
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James E. Dobbins

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13. ABSTRACT

The report of Tread Design Study of 9.00R20 Radial Ply Tires is published to disseminate the detailed data and results of a test of eight groups of 9.00R20 tires that were considered to be candidates for military use. Two of the tire groups were radial ply tire carcasses that were retreaded with a TACOM proposed tread design. The data sources were engineering tests performed by Nevada Automotive Test Center at its test facilities.

The analysis methodology used was direct comparison of test results which were combined in rank order by level of comparative performance.

Key Words

Radial Tires
Sand Mobility
Traction
Braking

Mud Mobility
Rolling Resistance
Retreaded Tires
Steel Belted Tires
Ply Rating